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APPENDIX A EIA TOOL

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Otway Exploration Drilling Program Environment Plan - Appendix A

This spreadsheet contains tools which generated information that supports the Environment Plan development completed by ConocoPhillips Australia in preparation for to submission to NOPSEMA. It has been used in the development of the EP so that a systematic, reproducible, and thorough process is followed.

There are ten sections in this spreadsheet which contain the following information:

Section	Title	Purpose	Input	Output
1	Activity-Aspect Tool	A matrix to show the relationship between the operational details of the activity against planned and unplanned aspects.	Activity Description	Aspects to be considered in the Aspect-Impact-Receptor Tool.
2	Aspect-Impact-Receptor Tool	A matrix to show the relationships that need to be assessed in the EIA and ERA between the environmental aspects and the impacts that arise against the typical marine and coastal environmental receptors.	Activity-Aspect Tool	Screened impacts and risks ordered into lower and higher order matters to be assessed.
3	Commonwealth Legislation	Commonwealth legislation relevant to the Otway Exploration Drilling Program	PMST Search Tool (Appendix B) Activity Description	Management actions required to meet environmental management laws.
4	State Legislation	State legislation relevant to the Otway Exploration Drilling Program	EMBA	Management actions required to meet environmental management laws.
5	International Codes	International conventions and agreements relevant to the Otway Exploration Drilling Program	Activity Description	Management actions required to meet environmental management laws.
6	Receptor Management Plans	A detailed record of knowledge gathered about receptors identified through the Protected Matter Search Tool (PMST). Includes information about the relevant conservation actions required for each receptor used in the EIA process.	Aspect-Impact-Receptor Tool No effect distance based on research and justified thresholds.	Management actions required to meet EPBC Program requirements.
7	Other Relevant Guidance	Other published guidance relevant to the Otway Exploration Drilling Program	PMST Search Tool (Appendix B) Activity Description	Management actions required to meet environmental management guidance.
8	Cumulative Impact Assessment Scoping Tool	Ensures previous, current, and future activities have been properly considered in the EP.	NOPSEMA website Activity Description	List of aspects that need to be considered in the CIA Scoping Tool.
9	Cumulative Impact Assessment Tool	Assessment of the Otway Exploration Drilling Program cumulative impacts.	CIA Scoping Tool	Management actions required to meet EPBC Program requirements and environmental management laws.
10	Environmental Performance	A compilation of control measures against the environmental performance standards and measurement criteria.	Legislation and guidance Impact/Risk Assessment Company standards	Environmental performance required to the titleholder to manage environmental impacts and risks to ALARP.

Activities and Aspects Matrix

Activity	Offshore Drilling Activities						Support Activities		
	Survey Activities	Drilling Operations	Drilling Activities	Well Formation Evaluation	Well Test	P&A	Vessels	Helicopter	ROV
Aspect									
Planned Events									
Emissions – Underwater Sound (non-impulsive)		✓	✓			✓	✓	✓	✓
Emissions - Underwater Sound (impulsive)	✓			✓					
Emissions – Light		✓			✓		✓		✓
Emissions – Atmospheric		✓		✓	✓		✓	✓	
Planned Discharges – Drilling			✓			✓			
Planned Discharges - Operational		✓					✓		
Seabed Disturbance	✓	✓	✓			✓			
Interference with other marine users		✓					✓		
Unplanned Events									
Loss of Materials or Waste Overboard		✓					✓		
Minor Loss of Containment		✓					✓		✓
Interaction with Marine Fauna		✓					✓	✓	
Introduction, Establishment and Spread of IMS		✓					✓		
Hydrocarbon Release - MDO release		✓					✓		
Hydrocarbon Release - Loss of Well Control (LOWC)			✓						
Spill Response Activities									
Source Control	✓	✓	✓	✓	✓	✓	✓		✓
Monitoring, Evaluation and Surveillance							✓	✓	✓
Mechanical Dispersion							✓		
Oiled Wildlife Response							✓	✓	
Waste Management							✓		
Scientific Monitoring							✓	✓	✓

Aspects-Impact-Receptor Screening Tool

Aspects	Receptors	Physical					Ecological							Socio-economic Receptors		Conservation Values and Sensitivities	Cultural Environment	
	Impacts	Water Quality	Sediment Quality	Air Quality	Ambient Light	Ambient Sound	Benthic Communities	Coastal Habitats and Communities	Plankton	Marine Invertebrates	Fishes	Birds	Marine Reptiles	Marine Mammals	Commercial Fisheries	Other Marine and Coastal Users	KEFS/AMPs	Sea Country
Planned Events																		
Emissions - Underwater Sound (Continuous)	Change in ambient sound					✓												
	Injury/mortality to fauna									✓		✓	✓					
	Change in fauna behaviour									✓	X	✓	✓				✓	
	Change to values and sensitivities																	
	Changes to the functions, interests or activities of other users														✓			✓
Emissions - Underwater Sound (Impulsive)	Change in ambient sound					✓												
	Injury/mortality to fauna								X									
	Change in fauna behaviour									X	X	✓	✓					
	Change to values and sensitivities																	✓
	Changes to the functions, interests or activities of other users														X			✓
Emissions - Light	Change in ambient light				✓													
	Change in fauna behaviour										✓	✓						
	Injury/mortality to fauna										✓							
	Change to values and sensitivities																	✓
	Changes to the functions, interests or activities of other users														X			✓
Emissions - Atmospheric	Change in air quality			✓														
	Change in climate																	
	Change in water quality	✓																
	Change in habitat						✓	✓	✓	✓	✓	✓	✓	✓				
	Change to values and sensitivities																	✓
Planned Discharges -Drilling	Changes to the functions, interests or activities of other users													✓	✓			✓
	Change in sediment quality		✓															
	Change in water quality	✓																
	Change in habitat						✓			✓								
	Injury / mortality						✓		✓	✓	✓	✓	✓	✓			X	
Planned Discharged - Operational	Change to values and sensitivities																	✓
	Changes to the functions, interests or activities of other users																X	
	Change in water quality	✓																
	Injury / mortality								✓		✓	✓	✓					
	Change in fauna behaviour										✓	✓						
Seabed Disturbance	Change to values and sensitivities																	✓
	Changes to the functions, interests or activities of other users														✓	✓		✓
	Change in habitat						✓											
	Change in water quality	✓																
	Injury / mortality to fauna						✓										X	
Interference with Other Marine Users	Change to values and sensitivities																	
	Changes to the functions, interests or activities of other users														✓	✓		✓
	Changes to the visual amenity of coastal locations															✓		✓
Unplanned Events																		
Loss of Materials or Waste Overboard	Injury / mortality											✓	✓	✓				
	Change in habitat						✓											
	Changes to the functions, interests or activities of other marine and coastal users														X	X		✓
Minor Loss of Containment	Change in water quality	X																
	Injury/mortality to fauna								X	X	X	X	X	X				
	Change in values and sensitivities																X	
Interaction with Marine Fauna	Changes to the functions, interests or activities of other marine users																	X
	Injury/mortality to fauna									✓	✓	✓	✓					✓
	Change in values and sensitivities																	✓
Introduction of IMS	Change in values and sensitivities						✓			✓								
	Changes to the functions, interests or activities of other marine users														✓			X

Hydrocarbon Release - MDO release	Change in water quality	✓																
	Change in fauna behaviour						✓		✓	✓	✓	✓	✓	✓				
	Injury/mortality to fauna						✓		✓	✓	✓	✓	✓	✓				
	Change in values and sensitivities						✓	✓									✓	
	Changes to the functions, interests or activities of other marine users													✓	✓			✓
	Change in aesthetic value						✓									✓		
Hydrocarbon Release - Loss of Well Control (LOWC)	Change in water quality	✓																
	Change in fauna behaviour						✓		✓	✓	✓	✓	✓	✓				
	Injury/mortality to fauna						✓		✓	✓	✓	✓	✓	✓				
	Change in values and sensitivities						✓	✓									✓	
	Changes to the functions, interests or activities of other marine users													✓	✓			✓
	Change in aesthetic value						✓									✓		
Spill response Activities	Change in water quality	✓																
	Change in fauna behaviour						✓					✓						
	Change in habitat						✓	✓				✓						
	Injury / mortality to fauna						✓	✓				✓						
	Change in values and sensitivities																✓	
	Changes to the functions, interests or activities of other marine users													✓				✓

X

Subject to impacts/risks that are predicted to have a consequence considered as Negligible (1)

Commonwealth Legislation

Legislation	Objectives/Actions relevant to Otway Exploration Drilling Program	Application to Activity
<i>Australian Maritime Safety Authority Act 1990 (AMSA Act)</i>	Facilitates international cooperation and mutual assistance in preparing and responding to major oil spill incidents and encourages countries to develop and maintain an adequate capability to deal with oil pollution emergencies.	Requirements are implemented through the Australian Maritime Safety Authority (AMSA). AMSA is the lead agency for responding to oil spills in the Commonwealth marine environment and is responsible for implementing the Australian National Plan for Maritime Environmental Emergencies ('NatPlan'). Arrangements are detailed in the OPEP.
<i>Australian Heritage Council Act 2003</i>	An independent advisory council, the Australia Heritage Council, was established under the Act to provide expert advice on heritage matters. The Council plays a key role in assessment, advice, policy formation and support for major heritage programs including the assessment and nomination of places for the National Heritage and Commonwealth Heritage Lists.	There is the potential for cultural heritage areas or objects to be located within or associated with the operational areas and EMBA. Section 4.4.2 and 4.4.3 identifies known heritage within the EMBA.
<i>Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGGS Act, the Act)</i> <i>Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGSE Regulations, Environment Regulations)</i>	Provides the legislative framework for the exploration and recovery of petroleum and greenhouse gas (GHG) activities in Commonwealth waters (those areas that are more than three nautical miles from the territorial seal baseline). This Act establishes the Joint Authority for each offshore area, the National Offshore Petroleum Titles Administrator (NOPTA) and the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). The Joint Authorities are responsible for key petroleum title decisions in Commonwealth waters including, but not limited to, the release and grant of offshore petroleum exploration areas. NOPTA administers titles and data management for petroleum and greenhouse gas (GHG) titles in Commonwealth waters and provides expert advice, administration, compliance monitoring and data management in accordance with OPGGGS Act. NOPSEMA is the Independent regulator for health and safety, structural (well) integrity and environmental management for all offshore petroleum and GHG operations in Commonwealth waters and in coastal waters where regulatory powers and functions have been conferred. The Environment Regulations provide for the robust regulation of environmental management of petroleum and greenhouse gas storage activities in Commonwealth waters, and aim to ensure that activities in these areas are: <ul style="list-style-type: none"> Undertaken in a manner that is consistent with ecologically sustainable development In line with the objective that environmental impacts and risks are reduced to as low as reasonably practicable and are of an acceptable level. The Regulations require that a NOPSEMA accepted Environment Plan (EP) and Oil Pollution Emergency Plan (OPEP) be place for any petroleum activity prior to commencement. They also establish requirements for consultation in preparing an EP and for public comment.	The OPGGGS Act provides the regulatory framework for all offshore petroleum exploration and production activities in Commonwealth waters, to ensure that the activities are carried out to: <ul style="list-style-type: none"> be consistent with the principles of ecologically sustainable development as set out in section 3A of the EPBC Act. reduce environmental impacts and risks of the activity to be ALARP. ensure that environmental impacts and risks of the activity are of an acceptable level. Evidence showing that the activity will be undertaken in line with the principles of ecologically sustainable development, and that the risks and impacts resulting from these activities are acceptable and ALARP is provided in Section 6 and 7
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>	The EPBC Act is the Australian Government's central piece of environmental legislation which provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places—defined in the EPBC Act as matters of national environmental significance. On 28 February 2014, the NOPSEMA Program, which was endorsed by the Australian Government under the EPBC Act, came into effect. The Program provides for NOPSEMA to assess and make approval decisions for new offshore petroleum development projects and shorter-term activities. NOPSEMA's environmental assessment processes consider all project- and activity specific environmental impacts and risks, including but not limited to those relevant to matters protected under Part 3 of the EPBC Act. Decision-making under the Program ensures that environmental impacts and risks, including to matters protected under Part 3 of the EPBC Act, will be of an acceptable level and reduced to as low as reasonably practicable (ALARP). The object of the Environment Regulations is also to ensure that any petroleum activity or greenhouse gas storage activity is carried out in a manner consistent with the principles of ecologically sustainable development as set out in section 3A of the EPBC Act. Matters of National Environmental Significance (MNES) include: <ul style="list-style-type: none"> World heritage properties National heritage places Wetlands of international importance (Ramsar wetlands) Nationally threatened species and ecological communities Migratory species Commonwealth marine areas The Great Barrier Reef Marine Park Nuclear actions (including uranium mining) A water resource, in relation to coal seam gas and large coal mining developments. Example: Under the EPBC Act, all cetaceans (whales, dolphins and porpoises) are protected within the Australian Whale Sanctuary, which includes all Commonwealth waters from the state waters limit out to the boundary of the Exclusive Economic Zone. Section 229 of the EPBC Act makes it an offence to kill, injure or interfere with a cetacean within the Australia Whale Sanctuary.	Petroleum activities are excluded within the boundaries of a World Heritage Area (Sub regulation 10A(f)). <ul style="list-style-type: none"> The activity is not within a World Heritage Area. The EP must describe matters protected under Part 3 of the EPBC Act and assess any impacts and risks to these: <ul style="list-style-type: none"> Section 4 describes matters protected under Part 3 of the EPBC Act The EP must assess any actual or potential impacts or risks to MNES from the activity: <ul style="list-style-type: none"> Section 6 and 7 provide an assessment of the impacts and risks from the activity to matters protected under Part 3 of the EPBC Act.
<i>Environment Protection and Biodiversity Conservation Regulations 2000 (EPBC Regulations)</i>	Provides for the listing of threatened species and ecological communities, registration of critical habitats, the development of recovery and threat abatement plans and conservation agreements. Part 8 – Interacting with cetaceans and whale watching provides for the protection and conservation of cetaceans, including: <ul style="list-style-type: none"> Exclusion and cautions zones around cetaceans and calves Speed restrictions Avoidance actions Posting a lookout Aircraft heights. Part 9 provides for the conservation of biodiversity in commonwealth areas, Part 10 provides management principles for protected areas, and Parts 11 and 12 provide for commonwealth reserves and activities within these areas.	Interaction requirements are applicable to the activity in the event that a cetacean is sighted. Section 6 and 7 details how these requirements will be applied
<i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i> <ul style="list-style-type: none"> Part III (Prevention of pollution by noxious substances) Part IIIA (Prevention of pollution by packaged harmful substances) Part IIIC (Prevention of pollution by garbage) 	Regulates ship-related operational activities and invokes certain requirements of the MARPOL Convention relating to discharge of noxious liquid substances, sewage, garbage, air pollution etc. It requires that ships >400 gross tonnes have pollution emergency plans. Several Marine Orders (MO) are enacted under this Act relating to offshore petroleum activities, including: <ul style="list-style-type: none"> MO 91: Marine Pollution Prevention – Oil MO 93: Marine Pollution Prevention – Noxious liquid substances MO 94: Marine Pollution Prevention – Packaged harmful substances MO 95: Marine Pollution Prevention – Garbage MO 96: Marine Pollution Prevention – Sewage MO 97: Marine Pollution Prevention – Air Pollution MO 98: Marine Pollution Prevention – Anti-fouling Systems. The drilling rig and support vessels >400 gross tonnes will adhere to the relevant MOs by having a Shipboard Marine Pollution Emergency Plan (SMPEP), Oil Record Book and Garbage Management Plan in place and implemented, along with international pollution prevention certificates verifying compliance with oil, air pollution and sewage measures.	All ships that are involved in petroleum activities in Australian waters are required to follow the regulations of this Act along with all relevant MOs. Section 6 and 7 detail the requirements applicable to vessel activities.
<i>Protection of the Sea (Harmful Anti-fouling Systems) Act 1983</i>	Regulates the use of anti-fouling compounds and systems in Australian waters, developed as part of Australia's commitment to MARPOL and the International Convention on the Control of Harmful Anti-fouling Systems on Ships. It is an offence to engage in negligent conduct that results in a harmful anti-fouling compound being applied to a ship. Australian ships must hold anti-fouling certificates, provided they meet certain criteria.	The vessels to be used for the Otway Exploration Drilling Program will have anti-fouling management regimes in place that are consistent with this Act. MO 98: Marine Pollution Prevention – Anti-fouling Systems is enacted under this Act. Section 7.5 of the EP details the requirements applicable to vessel activities.
<i>Environment Protection (Sea Dumping) Act 1981</i>	Regulates the loading and dumping of waste at sea and the creation of artificial reefs in Australian waters. Australian waters stretch from the low-water mark of the Australian shoreline out to 200 nautical miles (nm). It does not include waters within the limits of a state or territory. It prohibits the ocean disposal of material considered too harmful to be released into the marine environment, regulates permitted ocean waste disposal to minimise its environmental impacts, and applies to all vessels, aircraft, and platforms in Australian waters, and to all Australian vessels and aircraft in any part of the sea.	There will be no dumping at sea that falls within the meaning of the legislation that would require a sea dumping permit to be obtained.
<i>AMSA Marine Orders Part 94 (Marine pollution prevention - packaged harmful substances) 2014</i>	Sets out the requirements for preventing harmful substances carried by regulated Australian vessels, domestic commercial vessels and Australian recreation vessels from entering the marine environment, including management of: <ul style="list-style-type: none"> Harmful substances in packaged form Washing substances overboard Notifying and reporting an incident. 	All ships involved in petroleum activities in Australian waters are required to abide to the requirements under this Act. Section 6 and 7 details the requirements applicable to vessel activities.
<i>AMSA Marine Orders Part 95 (Marine pollution prevention - garbage) 2018</i>	Sets out the requirements for management of: <ul style="list-style-type: none"> Cargo residues Discharges of animal carcasses Garbage management plans Garbage record books. 	All ships involved in petroleum activities in Australian waters are required to abide to the requirements under this Act. Section 6 and 7 details the requirements applicable to vessel activities.

<p><i>Navigation Act 2012 (& Regulations 2013) and various Marine Orders (appropriate to vessel class) enacted under this Act</i></p>	<p>Regulates ship-related activities in Commonwealth waters including Safety of Life at Sea (SOLAS) and specific requirements for navigational lighting and invokes certain requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) relating to equipment and construction of ships. Although the Act does not apply to the operation of petroleum facilities, it may apply to some of the actions of seabed survey and support vessels (seafarers) in Australian waters. Of relevance are:</p> <ul style="list-style-type: none"> • Chapter 6 (Safety of navigation), particularly Part 3 (Prevention of collisions). • AMSA MO 21 Safety of Navigation and Emergency Procedures. • AMSA MO 27 Safety of Navigation and Radio Equipment. • AMSA MO 28 Operations standards and procedures • AMSA MO 30 Prevention of Collisions. • AMSA MO 50 Special purpose vessels, such as those used for offshore drilling. • AMSA MO 58 Safe management of vessels • AMSA MO 70 Seafarer certification. 	<p>All relevant vessels (according to class) will adhere to the relevant marine orders with regard to navigation and preventing collisions in Commonwealth waters.</p> <p>Section 6 and 7 details the requirements applicable to vessel activities.</p>
<p><i>Biosecurity Act 2015</i></p> <p><i>Biosecurity Regulations 2016</i></p> <p><i>Biosecurity Amendment (Biofouling Management Regulations 2021)</i></p>	<p>Biosecurity obligations are administered by the Department of Agriculture, Fisheries and Forestry (DAFF) and include ballast water and biofouling requirements, specifically:</p> <ul style="list-style-type: none"> • Pre-arrival information must be reported through MARS before arriving in Australian waters • Biofouling management plan and record book in place • Offshore Biofouling Risk Assessment Register, which considers biofouling and ballast water related risks, which may lead to IMS inspections by suitably qualified personnel • Antifouling system certification for vessels is current and in accordance with AMSA Marine Order Part 98 (Antifouling systems). 	<p>The Biosecurity Act and regulations applies to the Australian territory which includes the airspace above and coastal seas to 12 m from the coastline. The Act and regulations governs vessels entering the Australian territory regarding ballast water and hull fouling, for the activity.</p> <p>Biosecurity risks associated with the activity are detailed in Section 7.5.</p>
<p><i>Biosecurity (Ballast Water and Sediment) Determination 2017 and the Australian Ballast Water Management Requirements Version 8 (DAWE, 2020)</i></p>	<p>The International Convention on the Control and Management of Ship's Ballast Water and Sediment (Ballast Water Management Convention) applies to waters out to 200 nm and is given effect in Australia through the Biosecurity Act 2015, Biosecurity (Ballast Water and Sediment) Determination 2017 and the Australian Ballast Water Management Requirements.</p> <p>Australian Ballast Water Management Requirements including ballast water treated via a ballast water treatment system (with Type Approval Certificate) and ballast water record system will be maintained with all ballast water discharges to be reported.</p> <p>Vessels moving between Australian ports and offshore installations, within Australian waters, will manage ballast water in accordance with Australia's domestic ballast water requirements. The acceptable area for a ballast water exchange between an installation and an Australian port is in sea areas >500 m from the offshore installation, and >12 nm from the nearest land (as per DAWE, Australian Ballast Water Management Requirements Version 8).</p>	<p>Provides requirements for vessels operating within Australian seas on how vessel operators should manage ballast water to comply with the Biosecurity Act.</p> <p>Section 7.5 details these requirements in relation to the management of ballast water.</p>
<p><i>Ozone Protection & Synthetic Greenhouse Gas Management Act 1989</i></p>	<p>This Act regulates the manufacture, importation and use of ozone depleting substances (ODS) which are typically used in fire-fighting equipment and refrigerants.</p>	<p>Applies to ODS substances which are discussed within Section 6.5 of the EP.</p>
<p><i>Fisheries Management Act 1991 (& Regulations 2009)</i></p>	<p>Administered by the Australian Fisheries Management Authority's (AFMA's) to:</p> <ul style="list-style-type: none"> • Implement efficient and cost-effective fisheries management on behalf of the Commonwealth • Ensure the exploitation of fisheries resources and the carrying on of any related activities are conducted in a manner consistent with the principles of ESD • Maximise the net economic returns to the Australian community from the management of Australian fisheries • Ensure accountability to the fishing industry and to the Australian community in management of fisheries resources, and • Achieve government targets in relation to the recovery of the costs of AFMA. 	<p>Provides the regulatory guidelines and other mechanisms to support necessary fisheries management decisions in the event of a hydrocarbon spill in Commonwealth waters.</p> <p>Section 4.7.6 details Commonwealth fisheries with the potential to operate within the EMBA.</p>
<p><i>Underwater Cultural Heritage Act 2018</i></p>	<p>Protects the heritage values of shipwrecks, sunken aircraft and relics (older than 75 years) in Australian Territorial waters from the low water mark to the outer edge of the continental shelf (excluding the State's internal waterways). The Act allows for protection through the designation of protection zones. Activities / conduct prohibited within each zone is specified.</p>	<p>In the event of removal, damage or interference to shipwrecks, sunken aircraft or relics declared to be historic under the legislation, where the activity is proposed with declared protection zones, or there is the discovery of shipwrecks or relics.</p> <p>Section 4.8.1 identifies maritime archaeological heritage in the EMBA.</p>
<p><i>Native Title Act 1993</i></p> <p><i>Native Title Legislation Amendment Act 2021</i></p>	<p>The Act has 4 main objectives:</p> <ol style="list-style-type: none"> 1. Provide for the recognition and protection of native title. 2. Establish ways in which future dealings affecting native title may proceed and to set standards for those dealings. 3. Establish a mechanism for determining claims to native title. 4. Provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title. 	<p>Native Title or Indigenous Land Use Agreements may be present within the operational area or EMBA as detailed in Section 4.8.3.</p>

State Legislation

Legislation	Objectives/Actions relevant to Otway Exploration Drilling Program	Application to Activity
Victoria		
<i>Aboriginal Heritage Act 2006 (& Regulations 2018)</i>	<p>The primarily purpose of the Act is to provide for the protection of Aboriginal cultural heritage in Victoria.</p> <p>Other objectives include:</p> <ul style="list-style-type: none"> • Empower traditional owners as protectors and managers of their cultural heritage on behalf of the people • Strengthen the relationship and maintain the right of Aboriginal people’s connection to the land, waters and other resources • Promote respects for Aboriginal cultural heritage and contribute to its protection and sustainable development of the land and environment <p>Through the Act the Victorian Aboriginal Heritage Council, Register Aboriginal Parties and the Victorian Aboriginal Heritage Register were established.</p>	<p>There is the potential for First Nations cultural heritage, and Registered Aboriginal Parties, to be located within or associated with the operational areas and EMBA.</p> <p>Section 4.8.2.2 identifies Victorian First Nations Heritage within the EMBA.</p>
<i>Environment Protection Act 2017 (& various Regulations)</i>	<p>Controls discharges and emissions (air, water, noise) to the environment within Victoria. It gives the Environment Protection Authority (EPA) powers to licence premises discharges to the marine environment, control marine discharges and to undertake prosecutions. Provides for the maintenance and, where necessary, restoration of appropriate environmental quality and is relevant to oil pollution in Victorian state waters.</p> <p>The State Environment Protection Policy (Waters of Victoria) designates:</p> <ul style="list-style-type: none"> • Spill response responsibilities by Victorian Authorities to be undertaken in the event of spills (DPT) with EPA enforcement consistent with the Act and the Pollution of Waters by Oil & Noxious Substances Act 1986. • Requires vessels not to discharge to surface waters sewage, oil, garbage, sediment, litter or other wastes which pose an environmental risk to surface water beneficial uses <p>Discharge of domestic ballast water from emergency response vessels into Victorian State waters must comply with these requirements:</p> <ul style="list-style-type: none"> • To protect state waters from marine pests introduced via domestic ballast water, ballast water management arrangements applying to all ships in State and territorial waters must be observed as per the Environment Protection (Ships’ Ballast Water) Regulations 2006, Waste Management Policy (Ships’ Ballast Water) and the Protocol for Environmental Management. • High risk domestic ballast water (ballast water which leachates from an Australian port or within the territorial sea of Australia (to 12 nm)), regardless of the source, must not be discharged into Victorian State waters. • Ship masters must undertake a ballast water risk assessment on a voyage by voyage basis to assess risk level, provide accurate and comprehensive information to the EPA on the status and risk of ballast water contained on their ships, and to manage domestic ballast water discharges with EPA written approval. 	<p>Applied to discharges from emergency response vessels into Victorian state waters.</p> <p>Vessel discharges during the activity and/or spill response are managed as detailed in Section 6 and 7.</p>
<i>Emergency Management Act 2013</i>	<p>Provides for the establishment of governance arrangements for emergency management in Victoria, including the Emergency Management Commissioner and an Inspector-General for Emergency Management. Provides for integrated and comprehensive prevention, response and recovery planning, involving preparedness, operational co-ordination and community participation, in relation to all hazards. These arrangements are outlined in the Emergency Management Manual Victoria.</p> <p>Provides for the emergency response structure for managing emergency incidents within Victorian State waters, triggered in the event of a spill impacting or potentially impacting State waters.</p>	<p>Emergency response structure for managing emergency incidents within Victorian waters.</p> <p>Emergency management structure would be triggered in the event that a hydrocarbon spill that extends into Victorian waters.</p> <p>Refer to OPEP</p>
<i>Marine (Drug, Alcohol and Pollution Control) Act 1988</i>	<p>Concerns the registration of vessels, pollution of the sea, and the safe and efficient operation of vessels on State waters. Outlines the Victorian Government response structure and contingency planning arrangements that must be implemented for marine pollution incidents that occur in Victorian waters.</p>	<p>Applies to all vessel masters, owners, and crew that are operating vessels within Victorian State waters responding to a spill event.</p>
<i>Flora and Fauna Guarantee Act 1988 (& Regulations 2020)</i>	<p>Purpose is to protect rare and threatened species; and enable and promote the conservation of Victoria’s native flora and fauna and to provide for a choice of procedures that can be used for the conservation, management or control of flora and fauna and the management of potentially threatening processes. Where a species has been listed as threatened an Action statement is prepared setting out the actions that have or need to be taken to conserve and manage the species and community.</p>	<p>Triggered if an incident results in the injury or death of a FFG Act listed species (e.g. collision with a whale).</p> <p>Action Statement controls for threatened species present in the EMBA, as adopted (as relevant) within this EP. Incident reporting requirements are detailed in Section 10.5.2 of the EP.</p>
<i>Heritage Act 2017</i>	<p>Purpose is to provide for the protection and conservation of the cultural heritage of Victoria. The Act provides procedures to identify places of state heritage significance, and of historical archaeological value and establishes processes for obtaining approvals for changes to those places.</p>	<p>Maritime Archaeological Heritage is described in Section 4.8.1 of the EP.</p> <p>Possibly triggered in the event of impacts to a known or previously un-located shipwreck in Victorian State waters whilst undertaking emergency response activities.</p> <p>Incident reporting requirements are detailed in Section 10.5.2 of the EP.</p>
<i>Marine Safety Act 2010 (& Regulations 2023)</i>	<p>Provides for safe marine operations in Victoria, including imposing safety duties on owners, managers and designers of vessels, marine infrastructure and marine safety equipment; marine safety workers, masters and passengers on vessels; regulation and management of vessel use and navigation in Victorian State waters; and enforcement provisions of Police Officers and the Victorian Director of Transport Safety. Reflects the requirements of international conventions - Convention on the International Regulations for Preventing Collisions at Sea & International Convention for the Safety of Life at Sea.</p> <p>Defines marine incidents and the reporting of such incidents to the Victorian Director of Transport Safety. Applies to vessel masters, owners, crew operating vessels in Victorian State waters.</p>	<p>Applies to all vessel masters, owners, and crew that are operating vessels in Victorian State waters under emergency response activities.</p> <p>Vessel safety operations during the activity and/or spill response are managed as detailed in Section 7.8 of the EP.</p>
<i>Fisheries Act 1995 (& Regulations 2019)</i>	<p>Provides a legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitats.</p>	<p>Commercial and recreational fishing activities within Victorian jurisdiction overlapped by the operational area and EMBA are described in Section 4.7.5.4 and 4.7.7 of the EP.</p> <p>Impacts and risks to commercial and recreational fishing are assessed in Section 6 and 7 of the EP.</p>
<i>Wildlife Act 1975 (& Regulations 2013)</i>	<p>The purpose of this Act is to promote the protection and conservation of wildlife. Prevents wildlife from becoming extinct and prohibits and regulates persons authorised to engage in activities relating to wildlife (including incidents). The Wildlife (Marine Mammal) Regulations 2019 prescribe minimum distances to whales and seals/seal colonies, restrictions on feeding/touching and restriction of noise within a caution zone of a marine mammal (dolphins (150 m), whales (300 m) and seals (50 m)).</p>	<p>Applies where vessels are within Victorian State waters responding to a spill event. Prescribes minimum proximity distances to whales, dolphins and seals will be maintained.</p> <p>Triggered if an incident results in the injury or mortality of a whale, dolphin or seal. Incident reporting requirements are detailed in Section 10.5.2 of the EP.</p>
<i>National Parks Act 1975 (& Regulations 2013)</i>	<p>Provide for the preservation and protection of the natural and cultural heritage values of parks, including marine national parks and coastal parks.</p>	<p>An assessment of the Victorian marine and coastal protected and sensitive areas in the EMBA environment is described in Section 4.4.6 and 4.4.7 of the EP.</p> <p>Reporting requirements in the event of a spill impacting or with the potential to impact State waters are detailed in the OPEP.</p>

<i>Pollution of Waters by Oil and Noxious Substances Act 1986 (POWBONS) (& Regulations 2022)</i>	Established to protect the sea and other waters from pollution by oil and noxious substances. Implements the MARPOL Convention (the International Convention for the Prevention of Pollution from Ships 1973) in Victorian State waters. Requires mandatory reporting of marine pollution incidents. Within Victorian State waters it restricts the discharge of treated oily bilge water according to vessel classification (>400 tonnes); discharge of cargo substances or mixtures; prohibition of garbage disposal and packaged harmful substances; restrictions on the discharge of sewage; regulator reporting requirements for incidents; ship construction certificates and survey requirements. Section 10 (Duty to report certain incidents involving oil and oily mixtures).	Triggered in the event of a hydrocarbon spill impacting or potentially impacting state waters. Reporting requirements in the event of a spill impacting or with the potential to impact State waters is detailed in the OPEP.
Tasmania		
<i>Environmental Management and Pollution control Act 1994 (EMPCA)</i>	The primary environment protection and pollution control legislation in Tasmania administered by the Environment Protection Authority (EPA-Tas). Fundamental objectives are the prevention, reduction and remediation of environmental harm, focussing on preventing environmental harm from pollution and waste. Relevant regulations under the EMPCA include: <ul style="list-style-type: none"> • Environmental Management and Pollution Control (General) Regulations 2017 • Environmental Management and Pollution Control (Waste Management) Regulations 2010 • The EPA Division Compliance Policy provides the Director of the EPA powers of compliance. 	Defines the EPA's jurisdiction during a spill event, regulates the management and control of controlled wastes and defines the fee structure to waste events and environmental protection notices. See OPEP.
<i>Emergency Management Act 2006</i>	Outlines the prevention, preparedness, and response and recovery procedures in order to protect life, property and the environment in a declared state emergency.	Describes emergency response structure for managing emergency incidents that occur within Tasmanian waters. Emergency management structure will be triggered in the event of a spill in or extending into Tasmanian state waters. The potential risks of unplanned events are addressed in section 7 of the EP and within the OPEP.
<i>Marine-related Incidents (MARPOL Implementation) Act 2020 (& Regulations)</i>	Deals specifically with discharges of oil and other pollutants from ships and gives effect in Tasmania to the MARPOL international convention on marine pollution.	Vessel discharges during the activity and/or spill response are managed as detailed in Section 6 and 7 of the EP.
<i>Living Marine Resources Management Act 1995</i>	Administered by Fishing Tasmania to achieve sustainable development of living marine resources having regard to the need to: <ul style="list-style-type: none"> • Increase the community's understanding of the integrity of the ecosystem upon which fisheries depend; and • Provide and maintain sustainability of living marine resources; and • Take account of a corresponding law; and • Take account of the community's needs in respect of living marine resources; and • Take account of the community's interests in living marine resources. 	Commercial fishing activities within Tasmanian jurisdiction overlapped by the operational area and EMBA are described in Section 4.7.8 of the EP. Impacts and risks to commercial fishing are assessed in Section 6 and 7 of the EP.
<i>Aboriginal Lands Act 1995</i>	The Act promotes reconciliation with the Tasmanian Aboriginal community by granting Aboriginal people parcels of land with historic or cultural significance. The Aboriginal Land Council of Tasmania is established as a body corporate. The Council has the following functions: <ul style="list-style-type: none"> • to use and sustainably manage Aboriginal land and its natural resources for the benefit of all Aboriginal persons • to exercise, for the benefit of all Aboriginal persons, the Council's powers as owner of Aboriginal land • to prepare management plans in respect of Aboriginal land • to use and sustainably manage any other land in which the Council acquires an interest, etc. 	Applies where an oil spill poses a risk to Tasmanian Aboriginal people's land protected under the Act. Section 4.8.2.1 identifies Tasmanian First Nations cultural Heritage within the EMBA.
<i>Aboriginal Heritage Act 1975</i>	The Act is the primary legislation for the protection of Aboriginal cultural heritage in Tasmania.	There is the potential for First Nations cultural heritage to be located within or associated with the operational areas and EMBA. Section 4.8.2.1 identifies Tasmanian First Nations cultural Heritage within the EMBA.
<i>Crown Lands Act 1976</i>	The Crown Lands Act is responsible for the management of Crown lands within Tasmania. Crown land is public land, managed and held in trust by the Government for the benefit of the Tasmanian community.	Applies where an oil spill poses a risk to Tasmanian Crown lands protected under the Act.
<i>Threatened Species Protection Act 1995</i>	Provides for the protection and management of threatened native flora and fauna and enables and promotes the conservation of native flora and fauna. The Act is administered by the Department of Primary Industries, Parks, Water and Environment (Tasmania) and provides schedules of taxa that have different categories of threatened status while establishing mechanisms for the listing and delisting of taxa.	Protected species are listed in Section 4.6 of the EP.
<i>Nature Conservation Act 2002</i>	An Act to make provision with respect to the conservation and protection of the fauna, flora and geological diversity of the State, to provide for the declaration of national parks and other reserved land and for related purposes	Tasmanian marine and coastal protected areas identified within the EMBA are detailed in Section 4.4.6.1 and 4.4.7.1.
<i>Historic Cultural Act 1995</i>	Developed to ensure that historic places that are of importance to Tasmania are recognised, protected and managed effectively as part of the Resource Management and Planning System. The Heritage Council is an independent body who is responsible for implementing the Heritage Act.	Maritime Archaeological Heritage is described in Section 4.8.1 of the EP. Possibly triggered in the event of impacts to a known or previously un-located shipwrecks in Tasmanian State waters whilst undertaking emergency response activities. Incident reporting requirements are detailed in Section 10.5.2 of the EP.
<i>National Parks and Reserves Management Act 2002</i>	The Department of Natural Resources and Environment, Tasmania Parks and Wildlife Service (PWS) is responsible for Reserves and Crown land, and several leases and licences in these areas. Each reserve category requires different management approaches and permit activities as described in the management objectives in Schedule 1 of the National Parks and Reserves Management Act 2022 and may be relevant in the event of a release of hydrocarbons affecting coastal waters associated with national parks and reserves.	Applies where an oil spill poses a risk to Tasmanian state parks protected under the Act. Tasmanian marine and coastal protected areas identified within the EMBA are detailed in Section 4.4.6.1 and 4.4.7.1. (Org ID: 14 NRE Tasmania; Event ID: 3241, 4145; FB ID: 54)
South Australia		
<i>Heritage Places Act 1993</i>	An Act to make provision for the identification, recording and conservation of places and objects of non-Aboriginal heritage significance; to establish the South Australian Heritage Council; and other purposes. Land is defined to include land covered with water.	Maritime Archaeological Heritage is described in Section 4.8.1 of the EP. Possibly triggered in the event of impacts to a known or previously un-located underwater heritage in South Australia State waters whilst undertaking emergency response activities. Incident reporting requirements are detailed in Section 10.5.2 of the EP.
<i>Aboriginal Heritage Act 1988</i>	An Act to provide for the protection and preservation of the Aboriginal heritage. Land is defined to include land lying beneath inland waters or the sea.	There is the potential for First Nations cultural heritage to be located within or associated with the EMBA. Section 4.8.2.3 identifies South Australia First Nations cultural Heritage within the EMBA.
<i>Marine Parks Act 2007 (& Regulations 2023)</i>	Primary responsibility of the Act is to provide for a system of marine parks for the state of South Australia. Objectives include: <ul style="list-style-type: none"> • protect and conserve marine biological diversity and marine habitats by declaring areas and providing management • assist in the maintenance of ecological processes, the adaptation to climate change, the protection and conservation of natural and/or cultural features and provide opportunities for public education and understanding. 	Applies where an oil spill poses a risk to South Australia's state marine parks protected under the Act. South Australia's marine protected areas identified within the EMBA are detailed in Section 4.4.6.3.
<i>National Parks and Wildlife Act 1972</i>	An Act to provide for the establishment and management of reserves for public benefit and enjoyment; to provide for the conservation of wildlife in a natural environment; and other purposes. Includes conservation of the marine environment.	Applies where an oil spill poses a risk to South Australia's state coastal parks protected under the Act. South Australia's coastal protected areas identified within the EMBA are detailed in Section 4.4.7.3.
<i>Fisheries Management Act 2007</i>	An Act to provide for the conservation and management of the aquatic resources and reserves of the State, the regulation of fishing and the processing of aquatic resources, the protection of aquatic habitats, aquatic mammals and aquatic resources and the control of exotic aquatic organisms and disease in aquatic resources.	Commercial fishing activities within South Australia jurisdiction overlapped by the EMBA are described in Section 4.7.9 of the EP. Impacts and risks to commercial fishing are assessed in Section 6 and 7 of the EP.
New South Wales		

<i>Heritage Act 1977</i>	Provides for the identification, protection, promotion and conservation of items of State heritage significance (including shipwrecks within state waters) in NSW.	Maritime Archaeological Heritage is described in Section 4.8.1 of the EP. Possibly triggered in the event of impacts to a known or previously un-located underwater heritage in NSW State waters whilst undertaking emergency response activities. Incident reporting requirements are detailed in Section 10.5.2 of the EP.
<i>Marine Pollution Act 2012</i>	The Act aims to protect the State's marine and coastal environment from pollution by oil and certain other marine pollutants discharged from ships.	Applies to ships involved in petroleum activities in NSW waters. Triggered in the event of a spill entering NSW state waters. Applicable requirements of the proposed activities are described in Section 7.8 of this EP
<i>Fisheries Management Act 1994</i>	The Act is responsible for managing the NSW fishery resource with a broad objective to conserve, develop and share the fishery resources of the State for the benefit of present and future generations.	Commercial fishing activities within NSW jurisdiction overlapped by the EMBA are described in Section 4.7.10 of the EP. Impacts and risks to commercial fishing are assessed in Section 6 and 7 of the EP.
<i>National Parks and Wildlife Act 1974</i>	An Act provides for the establishment, preservation and management of national parks, historic sites and certain other areas and the protection of certain Aboriginal objects.	Applicable where an oil spill poses a risk to NSW parks, reserves and fauna and flora protected under the Act. Relevant environmental and social receptors that maybe impacted by an oil spill have been identified in Section 4 of this EP. Additionally, stakeholder consultation undertaken is detailed in Section 3.
<i>Protection of the Environment Operations Act 1997</i>	An Act to protect, restore and enhance the quality of the environment, including the marine environment.	Applicable where oil spill poses a risk to NSW state waters and coastline. Stakeholder consultation undertaken is detailed in Section 3. Emergency response arrangements are detailed in Section 7.8 and the OPEP.
<i>Wilderness Act 1987</i>	The Act provides for the identification of wilderness and the protection and management of wilderness areas across the State while promoting education of the public.	Applicable where an oil spill poses a risk to NSW state waters and coastline protected under the Act. Relevant environmental and social receptors that maybe impacted by an oil spill have been identified in Section 4. Incident reporting requirements are detailed in Section 10.5.2 of the EP.

International Codes

Agreement/Convention	Objectives/Actions relevant to Otway Exploration Drilling Program
Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREGS)	Provides instruction on the rules of operating vessels at sea to ensure safe travel. The <i>Navigation Act 2012</i> and subsidiary Marine Orders give effect to the regulations in Australia.
Convention on the International Maritime Organisation 1948	Provides advice on how to efficiently and sustainably travel overseas in relation to navigation, maritime safety and marine pollution.
International Convention of Civil Liability for Oil Pollution Damage, 1969 and 1992 (CLC 69; CLC 92)	The convention provides guidance on the ships liability in the case of a maritime casualty to ensure adequate compensation for those affected.
International Convention for the Prevention of Pollution from ships, London, 1973/1978 (commonly known as MARPOL 73/78)	The convention provides guidance on the minimisation and prevention of potential and planned marine pollution associated with offshore activities. In Australia the <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i> and subsidiary Marine Orders give effect to MARPOL 73/78.
International Convention on Oil Pollution, Preparedness, Response and Cooperation 1990	This convention provides a framework which facilitates international co-operation and mutual assistance in preparing for and responding to major oil pollution incidents.
London Protocol and Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1996	The convention provides guidance on the prevention of marine pollution and the disposal of waste from vessels. The <i>Environment Protection (Sea Dumping) Act 1981</i> gives effect to the London Convention.
International Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989 (Basel Convention)	The convention regulates and provides instruction on the appropriate handling, export and disposal of hazardous waste. The <i>Hazardous Waste (Regulation of Exports and Imports) Act 1989</i> gives effect to the convention.
Rotterdam Convention a multilateral treaty to promote shared responsibilities in relation to importation of hazardous chemicals	The convention provides instruction on the responsible handling and transport and international trade of specific hazardous chemicals.
International Convention on Harmful Anti Fouling Systems 2001 (AFS Convention)	The convention provides guidance for the evaluation of a vessels condition and how to properly apply, maintain, remove and dispose of anti-fouling coatings. The <i>Protection of the Sea (Harmful Anti-fouling Systems) Act 2006</i> and subsidiary Marine Order give effect to the Convention.
International Convention on the Control and Management of Ship's Ballast Water and Sediment (Ballast Water Management Convention)	The convention provides guidance on the management of ballast water to reduce the risk of the transfer of IMS. The <i>Biosecurity Act 2015</i> gives effect to the convention.
International Maritime Organization (IMO) Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Biofouling Guidelines)	The guidelines provide specific requirements for vessels to have a biofouling management plan and record book.
The Minamata Convention on Mercury	The convention was ratified by Australia in 2021 and calls on participants to protect human and environmental health from anthropogenic releases of mercury and mercury compounds . The Convention covers control and reduction of mercury in a range of processes and industries and is relevant to end-of-life aspects such as waste and contaminated sites. Mercury may be present in drilling fluids used during the OEDP such as barite and therefore controls must comply with the requirements of the convention.
Agreement on the Conservation of Albatrosses and Petrels (ACAP)	Multilateral international agreement that coordinates activities with the purpose to conserve albatross and petrel species by mitigating threats to these populations. The agreement provides instruction for countries regarding the conservation responsibilities of albatross and petrel species.
China Australia Migratory Birds Agreement (CAMBA)	The agreement provides advice on the conservation responsibilities regarding bird species that may use the OEDP as a migratory flyway between China and Australia (East Asian-Australasian Flyway). The <i>EPBC Act</i> gives effect to CAMBA by listing migratory birds recognised by the agreement as migratory under the EPBC Act.
Japan Australia Migratory Birds Agreement (JAMBA)	The agreement provides advice on the conservation responsibilities regarding bird species that may use the OEDP as a migratory flyway between Japan and Australia (East Asian-Australasian Flyway). The <i>EPBC Act</i> gives effect to JAMBA by listing migratory birds recognised by the agreement as migratory under the EPBC Act.
The Republic of Korea Migratory Birds Agreement (ROKAMBA)	The agreement provides advice on the conservation responsibilities regarding bird species that may use the OEDP as a migratory flyway between the Republic of Korea and Australia (East Asian- Australasian Flyway). The EPBC Act gives effect to ROKAMBA by listing migratory birds recognised by the agreement as migratory under the EPBC Act.
International Convention on the Conservation of Migratory Species of Wild Animals 1979 (Bonn Convention)	The treaty provides guidance on the conservation responsibilities regarding migratory species, their habitats and migration routes. The <i>EPBC Act</i> gives effect to the Bonn convention through listing species as migratory under Part 3 of the Act
International Convention for the Regulation of Whaling 1946	This convention includes a legally binding Schedule which includes catch limits for commercial and aboriginal whaling. The International Whaling Commission is responsible for amendments to this document.
United Nations Convention of Biodiversity 1992	This convention covers biodiversity across all levels (i.e. ecosystems, species and genetic resources). There are three main objectives for the treaty: <ul style="list-style-type: none"> • to conserve biological diversity • to use biological components sustainably • to provide fair and equitable access to the benefits of using genetic resources
The Convention on Wetlands (Ramsar Convention) 1971	The aim of the convention is to halt the worldwide loss of wetlands and to conserve through wise use and management those that remain. The convention therefore provides a framework to enable conservation and the wise use of wetlands and their resources.
United Nations Declaration on the Rights of Indigenous Peoples 2007	The Declaration details the rights of indigenous peoples in international law and policy and contains minimum standards for the recognition, protection and promotion of these rights. This was endorsed by Australia in 2009.

Receptor Management Plans

Recovery Plans established under the EPBC Act: Set out the research and management actions necessary to stop the decline of, and support the recovery of, listed threatened species or threatened ecological communities. The aim of a recovery plan is to maximise the long-term survival in the wild of a threatened species or ecological community.

Scientific Name	Common Name	Receptor Management Plans			
		Recovery Plan / Conservation Advice	Relevant Objectives	Relevant Key Threats	Relevant Conservation Actions
Amphibians					
<i>Litoria raniformis</i>	Growling Grass Frog, Southern Bell Frog	National Recovery Plan for the Southern Bell Frog <i>Litoria raniformis</i>	Secure extant populations, particularly those occurring in known breeding habitats, and improve their viability through increases in size and / or area of occurrence. Address known or predicted threatening processes, and implement appropriate management practices where possible to ensure that land use activities do not threaten survival. Increase community awareness and support for conservation.	Loss and degradation of habitat Biocides	No explicit relevant management actions No explicit relevant management actions
<i>Litoria watsoni</i>	Watson's Tree Frog	Conservation Advice for <i>Litoria watsoni</i>	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Litoria aurea</i>	Green and Golden Bell Frog	Conservation Advice for <i>Litoria aurea</i>	No explicit relevant objectives	Changes to water quality (pollution)	No explicit relevant management actions
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Conservation Advice for <i>Heleioporus australiacus</i>	No explicit relevant objectives	Hydrological changes (pollution)	No explicit relevant management actions
<i>Mixophyes balbus</i>	Stuttering Frog, Southern Barred Frog (in Victoria)	Conservation advice for <i>Mixophyes balbus</i>	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Uperoleia martini</i>	Martin's Toadlet	Conservation Advice for <i>Uperoleia martini</i> (Martin's toadlet)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
Fish					
Sharks and Rays					
<i>Carcharias taurus</i>	Grey Nurse Shark (East Coast Population)	Recovery Plan for the Grey Nurse Shark (<i>Carcharias taurus</i>)	The overarching objective of this recovery plan is to assist the recovery of the grey nurse shark in the wild, throughout its range in Australian waters, with a view to: • improving the population status, leading to future removal of the grey nurse shark from the threatened species list of the EPBC Act • ensure that anthropogenic activities do not hinder the recovery of the grey nurse shark in the near future, or impact on the long term conservation status of the species	Pollution and disease Habitat Modification Climate Change	7.1 Review and assess the potential threat of introduced species, pathogens and pollutants. 8.2 Review the level and spatial extent of protection measures at key aggregation sites to ensure appropriate levels of protection, and a consistent approach to the designation and implementation of protective measures, are applied. 8.3 Use Biologically Important Areas (BIA) to help inform the development of appropriate conservation measures, including through the application of advice in the marine bioregional plans on the types of actions which are likely to have a significant impact on the species and updating such conservation measures as new information becomes available. No explicit relevant management actions
<i>Carcharodon carcharias</i>	White Shark	Recovery Plan for the White Shark (<i>Carcharodon carcharias</i>)	Continue to identify and protect habitat critical to the survival of the white shark and minimise the impact of threatening processes within these areas.	Habitat modification/degradation	No explicit relevant management actions
<i>Centrophorus harrissoni</i>	Harrison's Dogfish	Commonwealth Listing Advice on <i>Centrophorus harrissoni</i> (Harrison's dogfish)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Centrophorus uyato</i>	Little Gulper Shark	Commonwealth Listing Advice on <i>Centrophorus zeehaani</i> (southern dogfish)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Galeorhinus galeus</i>	School shark, Eastern	Commonwealth Listing Advice on <i>Galeorhinus galeus</i>	No explicit relevant objectives	Habitat degradation (specifically in school shark nursery areas)	No explicit relevant management actions
<i>Rhincodon typus</i>	Whale Shark	Conservation Advice <i>Rhincodon typus</i> whale shark.	No explicit relevant objectives	Vessel strike Habitat disruption	Minimise offshore developments and transit time of large vessels in areas close to marine features likely to correlate with whale shark aggregations
<i>Zearaja maugeana</i>	Maugean skate, Port Davey skate	Approved Conservation Advice for <i>Raja sp. L</i> (Maugean Skate)	No explicit relevant objectives	No relevant threats identified to species long-term survival	No explicit relevant management actions
Fish					
<i>Epinephelus daemeli</i>	Black Rockcod	Approved Conservation Advice Black Cod (<i>Epinephelus daemeli</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Prototroctes maraena</i>	Australian Grayling	National Recovery Plan for Australian Grayling (<i>Prototroctes maraena</i>)	The overall objective of recovery is to minimise the probability of extinction of the Australian Grayling in the wild, and to increase the probability of important populations becoming self-sustaining in the long	Water Quality Pollution	Manage water quality where Australian Grayling occurs to maintain waters free of significant levels of nutrient, sediment, pesticide and other pollutants, consistent with the ANZECC guidelines for water quality (ANZECC 2000).

			term.	IMS	No explicit relevant management actions; Invasive Marine Species - introduced fish identified as threat.
<i>Rexea solandri</i> (eastern Australian population)	Eastern Gemfish	Commonwealth Listing Advice on Eastern Gemfish (<i>Rexea solandri</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Seriola lalandi</i>	Blue Warehou	Listing Advice <i>Seriola lalandi</i> Blue Warehou	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Nannoperca obscura</i>	Yarra pygmy perch	National Recovery Plan for the Yarra Pygmy Perch (<i>Nannoperca obscura</i>)	Identify and manage potentially threatening processes impacting on Yarra Pygmy Perch conservation.	No relevant threats identified to species long-term survival	N/A
		Approved Conservation advice for <i>Nannoperca obscura</i> (Yarra pygmy perch)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Galaxiella pusilla</i>	Dwarf Galaxias	National Recovery Plan for the Dwarf Galaxias (<i>Galaxiella pusilla</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
		Conservation Advice for <i>Galaxiella pusilla</i> (dwarf galaxias)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Brachionichthys hirsutus</i>	Spotted handfish	Recovery Plan for Three Handfish Species	<ul style="list-style-type: none"> • Increase spawning success for handfish; • Reduce impacts on handfish, and their habitat; • Consider options for the active management of handfish; • Improve knowledge of the distribution, abundance and population trends of handfish; • Increase understanding of habitat health and threats to handfish habitat; and, • Encourage community participation in the conservation of handfish. 	Habitat loss and degradation (pollution)	No explicit relevant management actions
<i>Brachiopsilus ziebelli</i>	Ziebell's handfish, Waterfall Bay handfish			Water pollution and siltation	No explicit relevant management actions
<i>Thymichthys politus</i>	Red handfish				
<i>Nannoperca variegata</i>	Variegated pygmy perch, Ewens pygmy perch, Golden pygmy perch	National recovery plan for the Variegated Pygmy Perch (<i>Nannoperca variegata</i>)	Identify and manage potentially threatening processes impacting on Variegated Pygmy Perch conservation.	No relevant threats identified to species long-term survival	N/A
<i>Thunnus maccoyii</i>	Southern Bluefin Tun	Commonwealth Listing Advice on <i>Thunnus maccoyii</i> (Southern Bluefin Tuna)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
Syngnathids					
<i>Hippocampus whitei</i>	White's Seahorse	Conservation Advice White's Seahorse (<i>Hippocampus whitei</i>)	No explicit relevant objectives	No relevant key threats	N/A
Birds					
<i>Acanthiza pusilla magnirostris</i>	King Island brown thornbill, brown thornbill (King Island)	No specific recovery plan or conservation advice however the King Island Biodiversity Management Plan is adopted.	To reduce current levels of threats and risks to biodiversity on King Island	Pollution	Continue to promote and encourage responsible use of chemicals, particularly around waterways and priority threatened species sites.
<i>Acanthornis magna greeniana</i>	King Island scrubtit, Scrubtit (King Island)				
<i>Aquila audax fleayi</i>	Tasmanian wedge-tailed eagle, Wedge-tailed eagle	Threatened Tasmanian Eagles Recovery Plan 2006-2010	Reduce the occurrence of eagle mortalities and injuries (in number and proportion), particularly those attributable to human activities.	No relevant threats identified to species long-term survival	N/A
		Conservation Advice Regent Honeyeater (<i>Anthochaera phrygia</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A

<i>Anthochaera phrygia</i>	Regent Honeyeater	National Recovery Plan for the Regent Honeyeater (<i>Anthochaera phrygia</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Aphelocephala leucopsis</i>	Southern Whiteface	Conservation Advice for <i>Aphelocephala leucopsis</i> (southern whiteface)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Ardenna grisea</i>	Sooty Shearwater	Conservation Advice for <i>Ardenna grisea</i> (sooty shearwater).	The primary conservation objectives for the conservation advice are; <ul style="list-style-type: none"> To increase the trend of Australian breeding population The At-sea losses within Australia remain minimal 	No relevant threats identified to species long-term survival	N/A
<i>Arenaria interpres</i>	Ruddy Turnstone	Conservation Advice for <i>Arenaria interpres</i> (ruddy turnstone)	Minimise further loss of habitat critical to the survival of common greenshank throughout Australia (including habitat predicted to become habitat critical to the survival of the species in the future because of climate change).	Acute Pollution	No explicit relevant management actions; oil pollution recognised as a threat.
				Habitat loss, disturbance and modifications	Ensure that future development projects avoid any activities that disproportionately affect the upper tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies, and site managers
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Conservation Advice Australasian Bittern (<i>Botaurus poiciloptilus</i>)	No explicit relevant objectives	Habitat loss and degradation (reduced water quality)	No explicit relevant objectives or management actions provided.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Approved Conservation Advice for <i>Calidris acuminata</i> (sharp-tailed sandpiper)	Australian Objective: Minimise further loss of habitat critical to the survival of sharp-tailed sandpiper throughout Australia.	Habitat loss, degradation and fragmentation	Ensure that future development projects avoid any activities that disproportionately affect the upper tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies, and site managers
<i>Calidris canutus</i>	Red Knot	Conservation Advice Red Knot (<i>Calidris canutus</i>)	Minimise further loss of habitat critical to the survival of red knot throughout Australia (including habitat predicted to become habitat critical in the future because of climate change)	Acute Pollution	No explicit relevant management actions; oil pollution recognised as a threat.
				Habitat loss, disturbance and modifications	Ensure that future development projects avoid any activities that disproportionately affect the upper tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies, and site managers
<i>Calidris ferruginea</i>	Curlew Sandpiper	Conservation Advice Curlew Sandpiper (<i>Calidris ferruginea</i>)	No explicit relevant objectives	Habitat degradation/ modification (pollution)	No explicit relevant management actions; oil pollution recognised as a threat.
<i>Calidris tenuirostris</i>	Great Knot	Conservation Advice Great Knot (<i>Calidris tenuirostris</i>)	Minimise further loss of habitat critical to the survival of red knot throughout Australia (including habitat predicted to become habitat critical in the future because of climate change)	Acute Pollution	No explicit relevant management actions; oil pollution recognised as a threat.
				Habitat loss, disturbance and modifications	Ensure that future development projects avoid any activities that disproportionately affect the upper tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies, and site managers
<i>Callocephalon fimbriatum</i>	Gang-gang cockatoo	Conservation advice for <i>Callocephalon fimbriatum</i> (Gang-gang cockatoo)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Calyptorhynchus banksii graptogyne</i>	South-eastern red-tailed black-cockatoo	National Recovery Plan for the South Eastern Red-tailed Black-Cockatoo <i>Calyptorhynchus banksii graptogyne</i>	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Calyptorhynchus lathami lathami</i>	South-eastern glossy black-cockatoo	Conservation Advice for <i>Calyptorhynchus lathami lathami</i> (South-eastern glossy black-cockatoo)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Ceyx azureus diemenensis</i>	Tasmanian azure kingfisher	Listing Advice on <i>Ceyx azureus diemenensis</i> (Tasmanian Azure Kingfisher)	No explicit relevant objectives.	No relevant threats identified to species long-term survival	N/A
<i>Charadrius leschenaultii</i>	Greater Sand Plover	Conservation Advice Greater Sand Plover (<i>Charadrius leschenaultii</i>)	No explicit relevant objectives	Habitat Loss and Degradation (oil pollution)	No explicit relevant objectives or management actions provided.
<i>Charadrius mongolus</i>	Lesser Sand Plover	Conservation Advice Lesser Sand Plover (<i>Charadrius mongolus</i>)	No explicit relevant objectives	Habitat Loss and Degradation (oil pollution)	No explicit relevant objectives or management actions provided.
<i>Dasyornis brachypterus</i>	Eastern bristlebird	National Recovery Plan for Eastern Bristlebird (<i>Dasyornis brachypterus</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A

<i>Diomedea spp.</i>	<ul style="list-style-type: none"> • Antipodean Albatross • Gibson's Albatross • Southern Royal Albatross • Wandering Albatross • Northern Royal Albatross • Shy Albatross • White-capped Albatross • Black-browed Albatross • Salvin Albatross • Campbell Albatross • Southern Giant Petrel • Northern Giant Petrel • Sooty Albatross • Buller's Albatross • Northern Buller's Albatross • Grey-headed Albatross • Indian Yellow-nosed Albatross • Chatham Albatross 	National Recovery Plan for Albatrosses and Giant Petrels (2022)	<p>Overall objective: To improve the conservation status of albatrosses and petrels so that these species are on a trajectory towards no longer being threatened in Australia's jurisdiction.</p> <p>Specific Strategies: <ul style="list-style-type: none"> • Ensure ongoing protection of albatross and petrel breeding sites and habitats in Australia's jurisdiction. • Improve effectiveness of management measures that reduce marine-based threats to albatrosses and petrels foraging in Australia's jurisdiction. • Improve understanding of generalised threats to albatrosses and petrels breeding and foraging within Australia's jurisdiction. </p>	Marine Pollution	<p>Minimise the effects of marine debris, plastics and pollution: Undertake, as feasible, monitoring of breeding colonies for marine debris, plastics and marine pollution impacts including, as a priority.</p> <ul style="list-style-type: none"> • incidence of oiled birds at nest • levels of marine debris egestion and entanglement at nest • effect of plastics and marine pollution • develop baseline measures of levels of heavy metals and persistent organic pollutants. <p>Develop risk based response strategies for marine pollution incidents are developed.</p>
				Marine infrastructure interactions	No explicit relevant management actions.
				Climate Variability and Change	Improve understanding of the effects of climate change on albatrosses and petrels, and identify ways to increase the resilience of the species to these effects.
<i>Falco hypoleucos</i>	Grey Falcon	Conservation Advice Grey Falcon (<i>Falco hypoleucos</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Gallinago hardwickii</i>	Latham's Snipe	Conservation Advice for <i>Gallinago hardwickii</i> (Latham's snipe)	Minimise further loss of habitat critical to the survival of common greenshank throughout Australia (including habitat predicted to become habitat critical to the survival of the species in the future because of climate change).	No relevant threats identified to species long-term survival	N/A
<i>Grantiella picta</i>	Painted Honeyeater	Conservation Advice Painted Honeyeater (<i>Grantiella picta</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Halobaena caerulea</i>	Blue petrel	Conservation Advice <i>Halobaena caerulea</i> blue petrel	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Hirundapus caudacutus</i>	White-throated Needletail	Conservation Advice White-throated Needletail (<i>Hirundapus caudacutus</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Leipoa ocellata</i>	Malleefowl	National Recovery Plan for Malleefowl <i>Leipoa ocellata</i>	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Lathamus discolor</i>	Swift Parrot	Conservation Advice Swift Parrot (<i>Lathamus discolor</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
		National Recovery Plan for the Swift Parrot (<i>Lathamus discolor</i>)	By 2032, anthropogenic threats to swift parrot are demonstrably reduced.	No relevant threats identified to species long-term survival	N/A
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit	Conservation Advice for <i>Limosa lapponica baueri</i> (Alaskan bar-tailed godwit)	Minimise further loss of habitat critical to the survival of grey plover throughout Australia (including habitat predicted to become habitat critical to survival in the future because of climate change).	Habitat loss, degradation and fragmentation	Ensure that future development projects avoid any activities that disproportionately affect the upper-tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies and site managers.
				Acute Pollution	No explicit management action; oil spills recognised as a threat
<i>Limosa limosa</i>	Black-tailed Godwit	Conservation Advice for <i>Limosa limosa</i> (black-tailed godwit).	Minimise further loss of habitat critical to the survival of common greenshank throughout Australia (including habitat predicted to become habitat critical to the survival of the species in the future because of climate change).	Habitat loss, degradation and fragmentation	Ensure that future development projects avoid any activities that disproportionately affect the upper-tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies and site managers.
				Acute Pollution	No explicit management action; oil spills recognised as a threat
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	Conservation Advice for <i>Melanodryas cucullata cucullata</i> (hooded robin (south-eastern))	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A

<i>Neophema chrysogaster</i>	Orange-bellied parrot	National Recovery Plan for the Orange-bellied Parrot, <i>Neophema chrysogaster</i>	Sets out research and management actions to stop the decline of, and support the recovery of, listed threatened species or threatened ecological communities, with the aim of maximising long-term survival in the wild.	Barriers to movement	Assess and manage the risks from development proposals that may represent a barrier to migration or movement
<i>Neophema chrysostoma</i>	Blue-winged Parrot	Conservation Advice for <i>Neophema chrysostoma</i> (blue-winged parrot)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Numenius madagascariensis</i>	Eastern Curlew	Conservation Advice Eastern Curlew (<i>Numenius madagascariensis</i>)	Australian Objectives: Reduce disturbance at key roosting and feeding sites	Habitat loss and degradation (pollution)	No explicit relevant management actions; pollution impacts recognised as a threat.
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)	Conservation Advice Fairy Prion (<i>Pachyptila turtur subantarctica</i>)	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A
<i>Pardalotus quadragintus</i>	Forty-spotted pardalote	Conservation Advice Pardalotus quadragintus forty-spotted pardalote	No explicit relevant objectives	No relevant threats identified to species long term survival.	N/A
<i>Pedionomus torquatus</i>	Plains-wanderer	Conservation advice <i>Pedionomus torquatus</i> plains wander	No explicit relevant objectives	No relevant threats identified to species long term survival.	N/A
<i>Platycercus caledonicus brownii</i>	Green rosella (King Island)	Conservation Advice Platycercus caledonicus brownii green rosella (King Island)	No explicit relevant objectives.	No relevant threats identified to species long term survival.	N/A
<i>Pluvialis squatarola</i>	Grey Plover	Approved Conservation Advice for <i>Pluvialis squatarola</i> (grey plover)	Minimise further loss of habitat critical to the survival of grey plover throughout Australia (including habitat predicted to become habitat critical to survival in the future because of climate change).	Habitat Loss	Ensure that future development projects avoid any activities that disproportionately affect the upper tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies and site managers.
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	Recovery Plan Gould's Petrel (<i>Pterodroma leucoptera leucoptera</i>)	No explicit relevant objectives.	Oil spills (oceanic only)	N/A
<i>Pterodroma neglecta neglecta</i>	Kermadec Petrel (western)	Lord Howe Island Biodiversity Management Plan	To protect and enhance threatened fauna habitat.	Habitat Degradation / Modification	Reduce impacts of fishing and marine debris on seabirds.
<i>Fregetta grallaria grallaria</i>	White-bellied Storm-Petrel				
<i>Pterodroma mollis</i>	Soft-plumage Petrel	Conservation Advice for <i>Pterodroma mollis</i> soft-plumage petrel	No explicit relevant objectives	No relevant threats identified to species long term survival.	NA
<i>Rostratula australis</i>	Australian Painted Snipe	Approved Conservation Advice Australian Painted Snipe (<i>Rostratula australis</i>)	No explicit relevant objectives	No relevant threats identified to species long term survival.	NA
<i>Pycnoptilus floccosus</i>	Pilotbird	Conservation Advice <i>Pycnoptilus floccosus</i> (Pilotbird)	No explicit relevant objectives	Habitat loss and degradation	Actions that have indirect impacts on habitat critical to the survival should be minimised and adequately mitigated (e.g. light pollution).
<i>Stagonopleura guttata</i>	Diamond Firetail	Conservation Advice for <i>Stagonopleura guttata</i> (diamond firetail)	No explicit relevant objectives	No relevant threats identified to species long term survival.	NA
<i>Strepera fuliginosa colei</i>	Black currawong (King Island)	Conservation Advice Strepera fuliginosa colei black currawong (King Island)	No explicit relevant objectives	No relevant threats identified to species long term survival.	N/A
<i>Sternula nereis nereis</i>	Australian Fairy Tern	Approved Conservation Advice Fairy Tern (<i>Sternula nereis nereis</i>)	No explicit relevant objectives	Oil spills	Ensure appropriate oil spill contingency plans are in place for the subspecies' breeding sites that are vulnerable to oil spills.
<i>Thalassarche cauta</i>	Shy Albatross	Conservation Advice Shy Albatross (<i>Thalassarche cauta</i>)	To ensure the long-term survival and recovery of albatross and giant petrel populations breeding and foraging in Australian jurisdiction by reducing or eliminating human related threats at sea and on land. Specific objectives: Marine-based threats to the survival and breeding success of albatrosses and giant petrels foraging in waters under Australian jurisdiction are quantified and reduced.	Marine Pollution	No explicit management actions; marine pollution, specifically marine plastics, recognised as a threat.
<i>Thinornis cucullatus cucullatus</i>	Eastern Hooded Plover	Conservation Advice Eastern Hooded Plover (<i>Thinornis cucullatus cucullatus</i>)	No explicit relevant objectives.	Oil Spills	Prepare oil spill response plans to ensure effective rehabilitation of oiled birds
				Entanglement and Ingestion of Marine Debris	Reduce occurrence of in-shore marine debris

<i>Tringa nebularia</i>	Common Greenshank	Conservation Advice for <i>Tringa nebularia</i> (common greenshank)	Minimise further loss of habitat critical to the survival of common greenshank throughout Australia (including habitat predicted to become habitat critical to the survival of the species in the future because of climate change).	Habitat loss, degradation and fragmentation	Ensure that future development projects avoid any activities that disproportionately affect the upper-tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies and site managers.
				Acute Pollution	No explicit management action; oil spills recognised as a threat
<i>Tyto novaehollandiae castanops</i> (Tasmanian population)	Masked owl (Tasmanian)	Approved Conservation Advice for <i>Tyto novaehollandiae castanops</i> (Tasmanian Masked Owl)	No explicit relevant objectives.	No relevant threats identified to species long term survival.	N/A
<i>Xenus cinereus</i>	Terek Sandpiper	Approved Conservation Advice for <i>Xenus cinereus</i> (Terek sandpiper)	Australian Objective: Minimise further loss of habitat critical to the survival of terek sandpiper throughout Australia.	Habitat loss, degradation and fragmentation	Ensure that future development projects avoid any activities that disproportionately affect the upper-tidal flats and/or areas providing major foraging opportunities as identified by species experts, local studies and site managers.
Reptiles					
<ul style="list-style-type: none"> <i>Caretta caretta</i> <i>Chelonia mydas</i> <i>Dermochelys coriacea</i> <i>Eretmochelys imbricata</i> <i>Natator depressus</i> 	<ul style="list-style-type: none"> Loggerhead Turtle Green Turtle Letherback Turtle Hawksbill Turtle Flatback Turtle 	Recovery Plan for Marine Turtles in Australia	<p>Long-term recovery objective: Minimise anthropogenic threats to allow for the conservation status of marine turtles to improve so that they can be removed from the EPBC Act threatened species list.</p> <p>Interim objective 3: Anthropogenic threats are demonstrably minimised.</p>	Habitat Modification	<p>A1: Maintain and improve efficacy of legal and management protection</p> <ul style="list-style-type: none"> Manage anthropogenic activities to ensure marine turtles are not displaced from identified habitat critical to the survival as per section 3.3 Table 6. Manage anthropogenic activities in Biologically Important Areas to ensure that biologically important behaviour can continue.
				Vessel Disturbance	Vessel interactions identified as a threat; no specific management actions in relation to vessels prescribed in the plan.
				Light Pollution	<p>A8. Minimise light pollution.</p> <ul style="list-style-type: none"> Artificial light within or adjacent to habitat critical to the survival of marine turtles will be managed such that marine turtles are not displaced from these habitats. Develop and implement best practice light management guidelines for existing and future developments adjacent to marine turtle nesting beaches. Identify the cumulative impact on turtles from multiple sources of onshore and offshore light pollution.
				Pollution (persistent toxic pollutants)	A4. Minimise chemical and terrestrial discharge.
				Marine Debris	<p>A3. Reduce the impacts from marine debris.</p> <ul style="list-style-type: none"> Support the implementation of the EPBC Act Threat Abatement Plan for the impacts of marine debris on vertebrate marine life.
				Noise Interference	<p>B3. Assess and address anthropogenic noise.</p> <ul style="list-style-type: none"> Understand the impacts of anthropogenic noise on marine turtle behaviour and biology.
<i>Dermochelys coriacea</i>	Leatherback Turtle	Approved Conservation Advice Leatherback Turtle (<i>Dermochelys coriacea</i>)	No explicit relevant objectives	Marine Debris	No explicit management actions; marine debris recognised as a threat.
				Vessel Strike	No explicit management actions; vessel strike recognised as a threat.
				Habitat Degradation	Identify and protect migratory corridors between nesting beaches and common foraging areas to facilitate colonization.
Marine Mammals					
<i>Low-Frequency (LF) Cetaceans</i>					
<i>Balaenoptera borealis</i>	Sei Whale	Conservation Advice Sei Whale (<i>Balaenoptera borealis</i>)	No explicit relevant objectives	Noise Interference	Once the spatial and temporal distribution (including biologically important areas) of sei whales is further defined an assessment of the impacts of increasing anthropogenic noise should be undertaken.
				Vessel Strike	<ul style="list-style-type: none"> Develop a national vessel strike strategy that investigates the risk of vessel strikes on Sei Whales and also identifies potential mitigation measures. Ensure all vessel strike incidents are reported in the National Vessel Strike Database
				Habitat Degradation (including pollution)	No explicit relevant management actions; pollution identified as a threat
<i>Balaenoptera musculus</i>	Blue Whale	Conservation Management Plan for the Blue Whale - A Recovery Plan under the EPBC Act 1999	The long-term recovery objective is to minimise anthropogenic threats to allow the conservation status of the Blue Whale to improve so that it can be removed from the threatened species list under the EPBC Act.	Vessel Strike	<p>A4: Minimise vessel collisions</p> <p>Develop a national vessel strike strategy that investigates the risk of vessel strike on blue whales and also identifies potential mitigation measures.</p> <p>Ensure all vessel strike incidents are reported in the National Ship Strike Database.</p> <p>Ensure the risk of vessel strikes on blue whales is considered when assessing actions that increase vessel traffic in areas where blue whales occur and, if required, appropriate mitigation measures are implemented.</p>
				Habitat Modification	No explicit relevant objectives or management actions identified
				Noise Interference	A2: Assess and address anthropogenic noise: shipping, industrial and seismic noise.
<i>Balaenoptera physalus</i>	Fin Whale	Conservation Advice Fin Whale (<i>Balaenoptera physalus</i>)	No explicit relevant objectives	Noise Interference	Once the spatial and temporal distribution (including biologically important areas) of Fin Whales is further defined, assess the impacts of increasing anthropogenic noise should be undertaken on this species.
				Vessel Strike	<ul style="list-style-type: none"> Develop a national vessel strike strategy that investigates the risk of vessel strikes on Sei Whales and also identifies potential mitigation measures. Ensure all vessel strike incidents are reported in the National Vessel Strike Database
				Pollution (persistent toxic pollutants)	No explicit relevant management actions; pollution identified as a threat

<i>Eubalaena australis</i>	Southern Right Whale	National Recovery Plan for the Southern Right Whale (DCCEEW 2024e)	<p>Interim recovery objectives: Recognising the multi-decadal period over which the recovery of southern right whales is likely to occur, the following interim recovery objectives have been set for a shorter period relevant to the species (e.g., 10 years).</p> <p>Interim objective 2: Anthropogenic threats are managed consistent with ecologically sustainable development principles to facilitate recovery of southern right whales.</p> <p>Target 2.1: Robust and adaptive management principles are implemented to reduce anthropogenic threats to southern right whales in Australian waters and minimise the risk of mortality, injury, auditory impairment, or disturbance to biologically important behaviours from anthropogenic activities.</p> <p>Target 2.2: Management decisions are supported by high quality information and scientific data, and high priority research areas identified in the Recovery Plan to deliver this information are supported through national and/or state funding programs and conservation planning.</p>	Entanglement - Marine debris	No explicit management actions; marine debris recognised as a threat.
				Habitat Degradation - Infrastructure / offshore development	<p>Action Area A2: Address habitat degradation impacts from coastal and offshore marine infrastructure developments within the species' range.</p> <p>1. Coastal and offshore development actions are assessed according to principles of ecological sustainable development to ensure the risk of injury, auditory impairment and/or disturbance to southern right whales is minimised.</p> <p>2. Baseline surveys and monitoring undertaken during activity implementation are conducted in accordance with best practice standards and guidelines to ensure standardised datasets are obtained and suitable to inform environmental management decision making that can reduce the risk of threats to southern right whales.</p> <p>3. Current information on species' occurrence, particularly in HCTS, BIAs, and historic high use areas, are used to inform planning, assessment, and decision-making on marine infrastructure development actions.</p>
				Anthropogenic Underwater Noise	<p>Action Area A5: Assess, manage, and mitigate impacts from anthropogenic underwater noise.</p> <p>2. Actions within and adjacent to southern right whale BIAs and HCTS should demonstrate that it does not prevent any southern right whale from utilising the area or cause auditory impairment.</p> <p>3. Actions within and adjacent to southern right whale BIAs and HCTS should demonstrate that the risk of behavioural disturbance is minimised.</p> <p>4. Ensure environmental assessments associated with underwater noise generating activities include consideration of national policy (e.g., EPBC Act Policy Statement 2.1) and guidelines related to managing anthropogenic underwater noise and implement appropriate mitigation measures to reduce risks to southern right whales to the lowest possible level.</p> <p>5. Quantify risks of anthropogenic underwater noise to southern right whales, including studies aimed to measure physiological effects, behavioural disturbance, and changes to acoustic communication (e.g., masking of vocalisations) to whales.</p>
				Collision - Vessel strike	<p>Action Area A6: Manage, minimise, and mitigate the threat of vessel strike.</p> <p>1. Assess the risk of vessel strike to southern right whales in BIAs.</p> <p>3. Ensure environmental impact assessments and associated plans consider and quantify the risk of vessel strike and associated potential cumulative risks in BIAs and habitat critical to the survival (HCTS) of the species.</p> <p>5. Ensure all vessel strike incidents are reported in the National Ship Strike Database managed through the Australian Marine Mammal Centre, Australian Antarctic Division.</p>
				Pollution	No explicit management actions; acute and chronic pollution recognised as a threat.
Cumulative Effects from Threats	No explicit management actions; cumulative impacts recognised as a threat.				
Pinnipeds					
<i>Neophoca cinerea</i>	Australian sea-lion, Australian sea lion	Conservation Advice <i>Neophoca cinerea</i> Australian Sea Lion	Mitigate the impacts of marine debris on Australian Sea Lion populations. Investigate and mitigate other potential threats to Australian Sea Lion populations, including disease, vessel strike, pollution, and tourism. Continue to develop and implement research and monitoring programs that provide outputs of direct relevance to the conservation of the Australian Sea Lion.	Entanglement in Marine Debris	No explicit relevant management actions; entanglement in marine debris identified as a threat.
				Noise interference	No explicit relevant management actions; noise interference identified as a threat.
				Habitat degradation (pollution))	All vessels to have oil spill mitigation measures in place and implement jurisdictional oil spill response strategies as required.
		Recovery plan for the Australian sea-lion (<i>Neophoca cinerea</i>)	Objective of this recovery plan is to halt the decline and assist the recovery of the Australian sea lion throughout its range in Australian waters by increasing the total population size while maintaining the number and distribution of breeding colonies	Pollution and oil spills	Where necessary mitigate the threat posed to Australian sea lion populations by vessel strike, pollution and oil spills. Actions to include: <ul style="list-style-type: none"> develop protocols for collection of biological samples and ensure that a portion of each sample (including those already collected) is centrally archived collect data on direct killings and confirmed vessel strikes implement jurisdictional oil spill response strategies as required.
<i>Mirounga leonina</i>	Southern elephant seal	Conservation Advice <i>Mirounga leonina</i> Southern elephant seal	No explicit relevant objectives	Pollution (including marine debris)	Receive accurate and timely reports of interactions with the species, whether the interaction is lethal or not, as well as opportune information on impact of marine debris or pollution events, may prompt responsive mitigation measures or initiate management responses even at the remote sites where the species is found.
		Sub-Antarctic Fur Seal and Southern Elephant Seal Recovery Plan	Ensure that any future anthropogenic impacts are not limiting their recovery	Marine pollution (including oil and non-biodegradable debris)	No explicit relevant management actions.
Other					
<i>Miniopterus orianae bassanii</i>	Southern Bent-wing Bat	Conservation Advice <i>Miniopterus orianae bassanii</i> Southern Bent-wing Bat	No explicit relevant objectives	No relevant threats identified to species long-term survival	N/A

Other Relevant Guidance

Other Relevant Guidance	Objectives/Actions relevant to Otway Exploration Drilling Program
<i>Fisheries Plans</i>	
Orange Roughy (<i>Hoplostethus atlanticus</i>) Stock Rebuilding Strategy 2022	Primary objective is to return all orange roughy stocks to levels where they can be harvested in an ecologically sustainable manner consistent with the Commonwealth Fisheries Harvest Strategy Policy and to ultimately maximise the economic returns to the Australian community. No relevant threats identified to species long term survival.
Blue Warehou (<i>Seriola lalandi</i>) Stock Rebuilding Strategy 2014	The strategy aims to rebuild the stocks to their biomass limit reference point (AFMA, 2014). No relevant threats identified to species long term survival.
Giant Crab Management Plan (Vic) 2010	Sets out arrangements to manage the commercial catch at levels that prevents overfishing, allows stocks to rebuild and reduces the risk of lower stock abundance. Identifies three main management objectives, being: <ul style="list-style-type: none"> • Sustainability of the giant crab resource • Resource access and utilisation • Cost-effective and participatory management. No relevant threats identified to species long term survival.
Victorian Rock Lobster Fishery Management Plan (Vic) 2017	Identifies five objectives for the rock lobster fishery: <ul style="list-style-type: none"> • Ensure the sustainability of the rock lobster resource. • Ensure a fair and equitable allocation of the rock lobster resource. • Ensure optimal economic utilisation of the rock lobster resource. • Cost-effective and participatory management • Maintain the ecological integrity of the fishery ecosystem. No relevant threats identified to species long term survival.
<i>National and State Plans</i>	
National Plan for Maritime Emergencies (NatPlan) (AMSA, 2000)	Implements Australia's obligations under the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969; United Nations Convention on the Law of the Sea, 1982; the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990; and the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 with respect to the management of maritime environmental emergencies.
State Maritime Emergencies (non-search and rescue) Plan (Victoria) (EMV, 2013)	Applies to Maritime Emergencies (non-search and rescue) including marine pollution which results, or may result, in a prohibited discharge into state waters of oil, an oily mixture, or an undesirable substance. <ul style="list-style-type: none"> • Provides the Victorian Marine Pollution Contingency Plan in accordance with the Marine (Drug, Alcohol and Pollution Control) Act 1988 (the Act). • Gives effect to Victoria's obligations under the National Plan for Maritime Environmental Emergencies and Intergovernmental Agreements. • Provides the State Emergency Response Plan Maritime Emergencies (NSR) Sub-plan in accordance with the Emergency Management Act 2013. • Provides strategic guidance for the effective management of maritime emergencies specifically addressing marine pollution (including oil and hazardous noxious substances) and/or maritime casualty NSR.
Tasmanian Marine Oil and Chemical Spill Contingency Plan (TasPlan) (EPA-Tas, 2022)	Documents the arrangements and procedures for prevention, preparedness, response, and recovery from a marine pollution event in Tasmanian waters. As a State plan, it sits within the national framework under the National Plan for Maritime Environmental Emergencies (NatPlan) and in accordance with the Intergovernmental Agreement (IGA) on the National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances. It is as an Associated Plan to the Tasmanian Emergency Management Arrangements (TEMA).
<i>Plans and Policy Statements established under the EPBC Act</i>	
South-east Commonwealth Marine Reserves Network Management Plan 2013-23 (DNP, 2013) – expiring June 2023	Outlines management strategies for research and monitoring, assessment and permitting, compliance, community participation, Indigenous involvement and environmental management. Identifies pressures on the conservation values of the South-east Commonwealth Marine Reserves Network including: <ul style="list-style-type: none"> • Noise pollution associated with shipping, other vessels and offshore mining operations and offshore construction. • Oil pollution associated with shipping, other vessels and offshore mining operations. • Invasive species and diseases translocated by vessels. • Light pollution associated with offshore mining operations and other offshore activities, and • Marine debris. Provides management strategies and actions to achieve objectives of the plan.
Draft South-east Marine Parks Network Management Plan 2024 (DNP, 2024)	Outlines proposed updates to South-east Commonwealth Marine Reserves Network Management Plan 2013-23 as detailed above. Identifies pressures on the conservation values of the South-east Commonwealth Marine Reserves Network including: <ul style="list-style-type: none"> • Physical disturbance associated with anchoring • Noise pollution associated with shipping, other vessels and offshore mining operations and offshore construction. • Oil pollution associated with shipping, other vessels and offshore mining operations. • Invasive species and diseases translocated by vessels. • Light pollution associated with offshore mining operations and other offshore activities, and • Marine debris. Provides management strategies and actions to achieve objectives of the plan.
Wildlife Conservation Plan for Seabirds (DCCEE, 2020)	Identifies objective 2: Seabirds and their habitats are protected and managed in Australia. Identifies resource extraction including collision with structures, oiling and incineration by flares; Implementing a comprehensive monitoring program of impacts of these offshore platforms should include nature, timing and extent of bird mortality caused by these structures. This information can then be used to better inform regulators responsible for exploration and extraction proposals; Proposals for oil and mineral exploration and exploitation should be adequately assessed and, as appropriate, conditions imposed to ensure there are no adverse effects on seabirds or their habitats. Acute pollution such as oil spill is explicitly identified as a direct and moderate threat to seabirds. Identifies pollution, including marine debris, lighting and acute pollution (given they spend much of their time on the sea surface, are vulnerable to the hazards of oil or fuel spills and are difficult to rehabilitate) as moderate threats with relevant actions: <ul style="list-style-type: none"> • Manage the effects of anthropogenic disturbance to seabird breeding and roosting areas. • Enhance contingency plans to prevent and/or respond to environmental emergencies that have an impact on seabirds and their habitats.
Wildlife Conservation Plan for Migratory Shorebirds (DoE, 2015b)	The background paper to the plan identifies acute pollution such as oil spill as a moderate threat to migratory shorebirds not due to direct contact but rather through impacting important habitat for many years through catastrophic loss of marine benthic food sources. No explicit relevant objectives or management actions.
Threat Abatement Plan for the Impacts of Marine Debris on Vertebrate wildlife of Australia's coasts and oceans (DoEE, 2018b)	Address key threatening processes listed under section 183 of the EPBC Act. Details harmful marine debris impacts on a range of marine life, including protected birds, sharks, turtles) and marine mammals. DoEE (2018) defines harmful marine debris to include all plastics and other types of debris from domestic or international sources that may cause harm to vertebrate marine wildlife. This includes land sourced plastic garbage (e.g. bags, bottles, ropes, fibreglass, piping, insulation, paints and adhesives), derelict fishing gear from recreational and commercial fishing activities and ship-sourced, solid nonbiodegradable floating materials lost or disposed of at sea.
EPBC Act Policy Statement 2.1 – Interactions between Offshore Seismic Exploration and Whales: Industry Guideline	Provides practical standards to minimise the risk of acoustic injury to whales in the vicinity of seismic survey operations and provides a framework that minimises the risk of biological consequences from acoustic disturbance from seismic sources to whales in biologically important habitat areas or during critical behaviours. Although these guidelines are specifically designed for seismic survey interactions with cetaceans, some of the provisions may also afford protection for marine species during survey and drilling activities (DEWHA, 2008).

Government Guidelines, Guidance Notes and Information Papers	
National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)	<p>Aims to manage artificial light so wildlife is:</p> <ul style="list-style-type: none"> • Not disrupted within, nor displaced from, important habitat • Able to undertake critical behaviours such as foraging, reproduction and dispersal. <p>Recommend using best practice lighting design to reduce light pollution and minimise the effect on wildlife and undertaking an environmental impact assessment for effects of artificial light on listed species for which artificial light has been demonstrated to affect behaviour, survivorship or reproduction.</p>
National biofouling management guidelines for the petroleum production and exploration industry (DAFF, 2009)	<p>Includes the following for operators of petroleum industry related vessels, equipment and infrastructure:</p> <ul style="list-style-type: none"> • Evaluation of biofouling risk of types of structures/facilities • Guidance on biofouling management and decommissioning • Recording and reporting. <p>Aligns with the IMO Biofouling Guidelines.</p>
National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna (DoEE, 2017a)	<p>Objectives are to acquire data, determine risks of vessel strike and identify mitigation measures, with the target audience being government agencies responsible for the regulation of marine fauna or vessel activities, industry and those involved in policy development or managing activities in the marine environment.</p>
2011 Guidelines for the Control and Management of Ships Biofouling to Minimise the Transfer of Invasive Aquatic Species (the IMO Biofouling Guidelines) (IMO, 2011)	<p>Provides internationally agreed guidance on how to minimise biofouling on vessels through application of biofouling prevention measures and hull husbandry practices provide a basis upon which operators can develop a vessel-specific biofouling management plan (BFMP) which:</p> <ul style="list-style-type: none"> • Provides specific details of the antifouling technology used, including antifouling paints and MGPS and how and when they are operated where relevant. • Describes the operating conditions suitable for the chosen technology. • Describes the operational profile of the vessel including operating speeds and time spent stationary. • Provides details of the areas of the hull that are particularly susceptible to biofouling, such as niche areas, and how the technology applied addresses this increased risk. • Provides information relating to the schedule of planned inspections, repairs, maintenance, inspection, and renewal of antifouling systems as well as circumstances by which opportunistic inspection to monitor efficacy might occur. • Describes the documentation required to verify any treatments and activities recorded in the biofouling record book.
Marine Pest Plan 2018-2023: National Strategic Plan for Marine Pest Biosecurity (2018-2023) (CoA, 2018)	<p>Provides Australia's national strategic plan for marine pest biosecurity and outlines a coordinated approach to building Australia's capacity to manage the threat of marine pests over five years.</p> <p>The key relevant objective is to minimise the risk of marine pest introduction, establishment and spread.</p>
Reducing marine pest biosecurity risks through good practice biofouling management (IP1899, NOPSEMA, 2022)	<p>NOPSEMA Information Paper intending to:</p> <ul style="list-style-type: none"> • Clarify biosecurity requirements relevant to offshore activities. • Provide coordinated good practice advice that is consistent with the expectations of all jurisdictions responsible for regulating biofouling management within the Australian marine environment. • Support the industry's contribution to marine pest risk management consistent with Australia's Marine Pest Plan 2018-2023 (CoA 2018).
Marine Biosecurity Management of Vessels Servicing the Offshore Industry (MIAL, 2020)	<p>Reference case developed by Maritime Industry Australia Ltd (MIAL) for use in the development of Environment Plans by titleholders for offshore resource activities located in Commonwealth waters.</p> <p>Applies to vessels used in the offshore resources industry, and not to offshore installations or trading ships.</p>
Acoustic impact valuation and management (N-04750-IP1765 A625748, NOPSEMA, 2020)	<p>Provides advice to titleholders to assist with preparing EPs with a particular focus on the components of an EP that relate to detailing, evaluating and managing impacts from acoustic emissions. Developed for seismic surveys, but with learnings for all offshore activities.</p>
ALARP and Acceptable for environmental impacts and environmental risks (Fact Sheet, NOPSEMA, 2020)	<p>Sets out NOPSEMA's considerations for determining whether impacts or risks are as low as reasonably practicable (ALARP) and acceptable.</p>
Environment plan decision making guideline (NOPSEMA, 2022)	<p>Set out NOPSEMA's considerations in making decisions in accordance with the legislated criteria relevant to EPs. This guideline:</p> <ul style="list-style-type: none"> • Communicates the key factors that influence NOPSEMA's decision making in relation to decision making criteria for acceptance criteria for EPs (r 10A). • Includes interpretation arising from the Federal Court appeal decision Santos NA Barossa Pty Ltd v Tipikalippa [2022] as it relates to NOPSEMA's decision making under R10A. • Provides information for proponents and stakeholders to understand NOPSEMA's regulatory decision making. • Imparts transparency on the way in which NOPSEMA's EP regulatory decisions are made.
Environment Plan Assessment (: N-04750-PL1347 A662608, NOPSEMA, 2020)	<p>Describes NOPSEMA's administration of the regulations that relate to environment plans (EPs) to ensure a documented, systematic and consistent approach to assessment and decision-making.</p>
Control measures and performance standards (N-04300-GN0271 A336398, NOPSEMA, 2020)	<p>Part of a series of documents that provide guidance on the preparation of safety cases for Australia's offshore facilities, as required under the Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 (the OPGGS(S) Regulations) and the corresponding laws of each State and of the Northern Territory</p>
Consultation in the Course of Preparing an Environment Plan (N-04750-GL2086, NOPSEMA, Updated May 2023)	<p>Supports clarity and transparency on the legal requirements, including recent case law, for consultation by titleholders in the course of preparing their Environment Plans prior to submission to NOPSEMA. The guideline will also support clarity and transparency around what NOPSEMA will take into consideration when assessing and deciding whether the consultation requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the Environment Regulations) have been met.</p>
Responding to public comment on environment plans guidance note (-GN1847, NOPSEMA, 2022)	<p>Provides assistance to titleholders in understanding the public comment process for exploratory drilling EPs. It applies solely to EPs prepared for assessment under the Environment Regulations.</p>
Environment plan content requirements guidance note (N1344, NOPSEMA, 2020)	<p>Interprets the EP content requirements that need to be met and demonstrated under the Environment Regulations and provides advice in relation to EP content requirements, the regulatory intent of content requirements, core concepts that are fundamental to each key content requirement and associated EP content considerations.</p>
Notification and reporting of environmental incidents (N-03000-GN0926 A710941, NOPSEMA, 2020)	<p>Sets out the legal obligations under the Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009 to report incidents to NOPSEMA within a specified period of time, depending on the impact or potential impact to the environment.</p>
Oil pollution risk management (GN1488, NOPSEMA, 2021)	<p>Provides titleholders with clarification on the regulatory requirements for oil pollution risk assessment as well as the content and level of detail required in an oil pollution emergency plan (OPEP).</p>
Oil Spill Modelling (Environmental Bulletin, NOPSEMA, 2019)	<p>Provides clarification for titleholders regarding the application and interpretation of oil spill modelling presented in environment plans. This is required to promote good practice and ensure that the community is better informed about the purpose and interpretation of oil spill modelling and to ensure the outputs of oil spill modelling are meaningful.</p>
Source control planning and procedures information paper (IP1979, NOPSEMA, 2021)	<p>Describes NOPSEMA expectations with regards to source control planning content of the Environmental Plan (EP), Well Operating Management Plan (WOMP) and the Source Control Emergency Response Plan (SCERP), and to describe the regulatory assessment focus of the EP and WOMP and the compliance monitoring inspection process and focus of the SCERP.</p>
Operational and scientific monitoring programs information paper (IP1349, NOPSEMA, 2020)	<p>Provides information and general advice to assist titleholders to plan for and implement Operational and Scientific Monitoring Programs (OSMPs) for oil spills from offshore activities. More specifically, this Information Paper:</p> <ul style="list-style-type: none"> • Sets out general principles and practical advice to assist titleholders in their planning for, and application of, fit-for-purpose OSMPs. • Addresses findings and recommendations of the Montara Commission of Inquiry, and implements the Final Australian Government Response to the Inquiry in relation to environmental monitoring for petroleum activities • Incorporates lessons learned from recent marine oil spills, where relevant; and • Captures information relevant to matters protected under the EPBC Act.
Financial assurance for petroleum titles guideline (GL1381, NOPSEMA, 2021)	<p>The purpose of this guideline is to provide advice to titleholders on how they can establish compliance with the duty to maintain sufficient financial assurance and demonstrate compliance to NOPSEMA prior to acceptance of an EP. The guideline describes NOPSEMA's administration of the financial assurance requirements set out in section 571 of the OPGGS Act and the Environment Regulations which apply to titleholders undertaking a petroleum activity under a petroleum title.</p>

Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species (DEE, 2017)	Developed under EPBC Act Policy Statement 3.21 to assist proponents in avoiding, assessing and mitigating significant impacts on migratory shorebirds listed under the EPBC Act, and is a key action under the Wildlife Conservation Plan for Migratory Shorebirds. Identifies that direct mortality of birds may result from a variety of activities including oils spills and actions that introduce risk of mortality in important habitat may result in a significant impact to shorebirds.
Cumulative impact assessment guidelines for state significant projects (NSW, 2022)	Aims to strengthen project-level cumulative impact assessment (CIA) for significant projects (in NSW). Provides general guidance on processes to consider impacts from a proposed project in combination with other future projects that are anticipated or reasonably foreseeable.
Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (UK, 2019)	Sets out a staged process for conducting cumulative impact assessment by: <ul style="list-style-type: none"> • Establishing the long list of other existing development and/or approved development • Establishing a short list of other existing development and/or approved development • Gathering information on location, design, program activities and environmental assessments • Conducting the assessment and evaluating significance • Describing mitigation and monitoring measures.
<i>Industry Guidelines</i>	
Environmental management in the upstream oil and gas industry (IOGP-IPIECA, 2020)	Provides a detailed overview of environmental management practices in the upstream oil and gas industry, with the primary focus on managing risks from potential impacts to the natural environment during exploration and production of oil and gas.
Environmental, Health and Safety Guidelines for Offshore Oil and Gas Development (World Bank Group, 2015)	Includes information relevant to exploratory drilling and ancillary and support operations including industry-specific impacts and management for e.g. air emissions, wastewater discharges, noise generation, spills, etc. They also address potential onshore impacts that may result from offshore oil and gas activities.
Environmental Manual for Worldwide Geophysical Operations (IAGC, 2013)	Provides guidance for all kinds of geophysical surveys (including seabed surveys). Of particular relevance are Section 8.4 (Travel – water travel) – maintain a lookout for, and establish communications with local fishing boats, tourist diving vessels, etc, where possible to minimise interruption with their operations and equipment.
Aerial Observations of Marine Oil Spills Technical Information Paper (ITOPF, 2011)	Presents advice and guidance on conducting effective aerial reconnaissance which are an important element of an effective response to most oil spills, for assessing the location and extent of contamination and verifying predictions of the movement and fate of oil slicks at sea. Aerial surveillance provides information facilitating deployment and control of operations at sea, the timely protection of sites along threatened coastlines and the preparation of resources for shoreline clean-up.
Aerial Observations of Oil Spills at Sea Good Practice Guideline (IPIECA/OGP, 2015)	Summarises a consensus of industry and government viewpoints on Aerial Observations of Oil Spills at the time of writing, to detect, characterise and quantify spilled oil that may be present in a range of settings (on-water, in-water and onshore). This enables the incident command to effectively determine the scale and nature of the oil spill incident, make decisions on where and how to respond, control various response operations and, over time, confirm whether or not the response is effective.
In-water Surveillance of Oil Spills at Sea Good Practice Guidelines (IPIECA/IOGP, 2016)	Summarises current views on good practice for a range of oil spill preparedness and response topics to help align industry practices and activities, inform stakeholders, and serve as a communication tool to promote awareness and education. Topics include surveillance, subsea response, communicating data and information and innovations and future developments.
Contingency Planning for Oil Spills on Water Good Practice Guidelines (IPIECA/IOGP, 2015)	Provides guidance on the contingency planning process for potential oil spills in or on water following an accidental release of oil to a marine or aquatic environment, whether that be during the handling, transport, production or storage of oil products.
Draft Technical Guidelines on the Archaeological Assessment of First Nations Underwater Cultural Heritage in Commonwealth Waters (DCCEEW, 2024f)	Provides specific guidance to development proponents on the minimum standard frameworks to identify, assess, and manage First Nations UCH within the submerged seabed landscape of Commonwealth waters. The draft technical guidelines reflect Australia’s evolving legislation and international commitments in matters of UCH, and are based on the internationally recognised UCH best practice and management principles.
<i>Case Law</i>	
Tipakalippa v National Offshore Petroleum Safety and Environmental Management Authority (No 2) [2022] FCA 1121 (Primary Decision) Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193 (Appeal Decision)	<p>On 21 September 2022, Justice Bromberg handed down his judgement in the Primary Decision. One of the issues covered in the judgement was how titleholders should identify the “universe of relevant persons” that may fall within section 11A(1) of the Environment Regulations. The process of identifying relevant person(s) is the first step in fulfilling the requirements of section 11A of the Environment Regulations. As stated in the Primary Decision, determining who falls within the description of (a), (b), (c) and (e) is a “relatively straightforward exercise” (para. 136 of the Primary Decision). However, the description of a relevant person in (d) can raise “substantial complexity” (para. 137 of the Primary Decision) as:</p> <ul style="list-style-type: none"> • The number of persons falling within the description may be very large and in numerous categories • The words “functions, interests or activities” must be construed with their intended meaning, and • The nature and extent of any potential effect upon the “functions, interests or activities” or particular persons or the categories of particular persons may be difficult to assess. <p>Based on the Appeal Decision and NOPSEMA’s subsequent Guidance Document (Consultation in the Course of Preparing an Environment Plan, N-04750-GL2086, NOPSEMA, Updated May 2023), the phrase “functions, interests or activities” should be constructed broadly as it best promotes the objects of the Environment Regulations, including that activities are carried out in a manner consistent with the principles of Ecologically Sustainable Development (ESD). The phrase is a composite one, each part of which has work to do in identifying relevant persons. The meaning of each part of the phrase is defined in NOPSEMA’s Guidance Document as follows:</p> <ul style="list-style-type: none"> • Functions – refers to “a power or duty to do something” (para. 60 of Appeal Decision); • Interests – to be construed as conforming with the accepted concept of “interest” in other areas of public administrative law. Includes “any interests possessed by an individual whether or not the interest amounts to a legal right or is a proprietary or financial interest or relates to reputation” (para. 63 & 65 of Appeal Decisions); and • Activities – to be read broadly and is broader than the definition of ‘activity’ in Regulation 4 of the Environment Regulations and is likely directed to what the relevant person is already doing (para. 51, 58 and 59 of Appeal Decision). <p>A methodology has been developed to accurately and transparently determine the relevant person(s) associated with the Otway Exploration Drilling Program, including those whose functions, interests, or activities as per (d) may be affected by the proposed activities. This methodology also includes an identification of those relevant person(s) that fall under (a), (b), (c) and (e) of Regulation 11A(1) of the Environment Regulations.</p> <p>For the purpose of this EP, and in accordance with NOPSEMA’s Guidance Document, the process of identifying relevant persons under Regulation 11A(1)d) has encompassed the concept of ‘Decisional Choice’ of which individuals/organisations may have functions, interests or activities in the activities proposed to be undertaken as part of this EP.</p>

Environmental Performance

Control Measure	EPS ID	Environmental Performance Standard	Measurement Criteria
CM01: Marine Assurance Process	1.1	The MODU and vessels will meet the safety measures and emergency procedures of Marine Order 21 - Safety and Emergency Arrangements	Vetting Records Assurance Review (Acceptance)
	1.2	The MODU and vessels will meet the navigation equipment, Automatic Identification System (AIS), watchkeeping, radar and lighting requirements of Marine Orders MO27 - Safety of Navigation and Radio Equipment and MO30 Prevention of Collisions.	Vetting Records Assurance Review (Acceptance)
	1.3	The MODU and vessels will meet survey, maintenance, and certification as per Marine Order 31 - SOLAS and non-SOLAS Certification.	Vetting Records Assurance Review (Acceptance)
	1.4	Seafarers on the MODU and vessels will meet training and competency requirements as per Marine Order 70 - Seafarer Certification.	Vetting Records Assurance Review (Acceptance)
	1.5	A documented Preventative Maintenance System (PMS) will be in place for equipment on the MODU, vessels and ROV that provides a status on the maintenance of equipment and detailed manufacturer's specification on maintenance procedures. <ul style="list-style-type: none"> Critical equipment on vessels and the MODU will be inspected to ensure effective operation. Power generation and propulsion systems on the MODU and vessels will be inspected to ensure efficient operation. 	Inspection Reports Vetting Records Assurance Review (Acceptance) PMS Reports
	1.6	Vessels and the MODU will comply with Marine Orders – Part 97: Marine Pollution Prevention – Air Pollution (appropriate to vessel class) for emissions from combustion of fuel, including: <ul style="list-style-type: none"> Hold a valid Air Pollution Prevention (APP) certification or equivalent in accordance with MARPOL Annex VI. (Vessels with diesel engines >130 kW must be certified to emission standards (e.g. International Air Pollution Prevention [IAPP]). National (AMSA) and International (IMO / MARPOL) Emissions and Discharge Standards for vessels Have a Ship Energy Efficiency Management Plan (SEEMP) as per MARPOL 73/78 Annex VI. Engine NOx emission levels will comply with Regulation 13 of MARPOL 73/78 Annex VI. Only MARPOL VI-approved waste incinerators shall be used to incinerate solid combustible waste (food waste, paper, cardboard, rags, plastics). Ozone Depleting Substances (ODS) handling procedures as per MARPOL Annex VI, including maintenance of ODS record book where rechargeable systems containing ODS are recharged or repaired. 	Rig Inspection Report Vetting Records Assurance Review (Rig Acceptance)
	1.7	Oil contaminated water shall be treated via a MARPOL (or equivalent) approved oily water separator and only discharge if oil content less than 15 ppm for vessels >400 tonne. Current certificate for system for vessels >400 tonne.	Oil Record Book Vetting Records
	1.8	Sewage discharged at sea shall be treated via a MARPOL (or equivalent) approved sewage treatment system.	MARPOL certification Vetting Records
	1.9	Food waste macerator specifications will be to ≤25 mm and discharges will occur at distances greater than 3 nm from land. Other types of garbage will be managed according to the Garbage Management Plan in accordance with MARPOL Annex V.	Garbage record book Vetting Records
	1.10	Vessel and MODU contractor prequalification assessments will be conducted in accordance with Marine Risk Management Standard (GMSTD- MA-003)) and Marine Vetting Criteria (GM-03A).	Vetting Records Assurance Review (Acceptance)
	1.11	Vessels and the MODU will have current anti-fouling certificates in accordance with Marine Order 98: Marine pollution – anti-fouling systems.	Sighting of relevant certificates Vetting Records Assurance Review (Acceptance)
	1.12	Prior to mobilisation for the program, the MODU and Vessels will comply with the Australian Ballast Water Requirements (Rev 8), specifically, ensuring they have: <ul style="list-style-type: none"> A valid Ballast Water Management Plan A Ballast Water Management Certificate, and A Ballast Water Record System with a minimum of 2 years records retained on board. 	Completed pre-arrival report Ballast Water Management Plan Ballast Water Management Certificate Vetting Records Assurance Review (Acceptance)
	1.13	Prior to mobilisation to the first drilling location for the program, the MODU will have a Biofouling Management Plan and Record Book consistent with IMO Biofouling Guidelines.	Biofouling Management Plan Biofouling Record Book Vetting Records Assurance Review (Rig Acceptance)
	1.14	Prior to mobilisation to the Otway Region, an IMS Risk Assessment will be conducted on the MODU and vessels by a qualified IMS inspector.	IMS Risk Assessment Report Vetting Records Assurance Review (Acceptance)
	1.15	Based on the outcomes of each IMS Risk Assessment, management measures commensurate with the risk will be implemented to minimise the likelihood of new IMS being introduced, or established IMS being spread within Australian waters.	IMS Risk Assessment Report Vetting Records Assurance Review (Acceptance)
	1.16	Prior to mobilisation to the Otway Region, the MODU will have received advice on biosecurity, pratique and berthing conditions from the Department of Agriculture, Fisheries and Forestry (DAFF)	Correspondence with Titleholder who brought MODU into Australian waters Vetting Records Assurance Review (Acceptance)
CM02: Vessel and MODU Operating Procedures	2.1	The MODU and vessels will abide by activity exclusion zones in place for other activities in the offshore Otway Basin, to minimise the potential for cumulative impacts.	Operational Log
	2.2	The MODU will conduct drilling activities at one location at a time, to minimise the potential for cumulative impacts.	Operational Log
	2.3	An Environment Plan induction will be delivered to all MODU and vessel personnel.	Induction Induction attendance Records

2.4	An explosives safety awareness briefing will be included in the Environment Plan induction delivered to all MODU and vessel personnel. Access to an on-call explosives engineer will be in place 30 days prior to the commencement of offshore activities.	Induction Induction attendance Records Contract
2.5	AIS will be monitored 24 hours per day - enabling the MODU to receive the data broadcasted by surrounding vessels, such as Maritime Mobile Service Identity (MMSI) number, IMO number, VHF call sign, speed, heading and course over ground. Where an AIS unit is not currently present on a vessel one will be installed, and navigation status will be set correctly.	HSE Inspections Vessel Logs Handover Logs
2.6	At least one support vessel will remain with the MODU during drilling activities, weather permitting.	Induction Vessel Log
2.7	Vessel speeds will be restricted to 5 knots within the drilling area and 10 knots within the operational areas.	Induction Vessel Logs Incident Report
2.8	A 500 m Petroleum Safety Zone (PSZ) will be gazetted and monitored around the MODU during the drilling activity.	PSZ gazetted
2.9	Access into the 500 m PSZ, including approach directions and speed, shall be managed via the MODU.	Vessel Logs
2.1	A 2 km cautionary zone will be established and monitored around the MODU during the drilling activity.	Vessel Logs
2.11	A 500 m Safe Navigation Area (SNA) will be established and monitored around survey vessel(s) and any towed equipment during the seabed survey.	Vessel Logs
2.12	An avoidance area will be established around the identified research program in VIC/P79 for the duration of the activity and will be communicated to vessel and MODU operators prior to commencement of the activity (Org ID: 508, Blue Whale Study, Org ID: 528, Australian Oceanographic Services Pty Ltd, Event ID: 3194, FB ID: 239).	Vessel Logs Vessel Tracks Consultation Records Induction Incident Report
2.13	Recreational fishing will not be permitted from vessels or the MODU.	Induction Vessel Logs Incident Report
2.14	Vessels will not exchange ballast water within 12 NM from the nearest land and in water depths of less than 50 m unless sourced from Australian waters.	Ballast water records
2.15	Vessels and aircraft will adhere to the distances and vessel management practices of EPBC Regulations (Part 8 Division 8.1 interacting with cetaceans) and Wildlife (Marine Mammals) Regulations 2009 and all vessels implement an increased caution zone of: <ul style="list-style-type: none"> • 500 m between whales (all species) and vessels, and • 1 km between southern right whale cows with calves and vessels 	MFO records show that vessels adhered to EPBC Regulations (Part 8) and increased buffer zones of 500 m for whales and 1 km for southern right whale cow calf pairs. Induction Package Training records
2.16	Vessels will not approach within a maintain 150 m distance from dolphins, marine turtles, seals and flocks of rafting seabirds, as described in the Fauna Management Plan (Appendix N) – CM08. [Updated in response to Matter: M18].	Fauna Management Plan Induction Package Training records
2.17	Critical equipment on vessels including power generation and propulsion systems or systems that generate or treat planned discharges and the MODU and vessels will be operated in accordance with manufacturer's instructions and maintained in accordance with the PMS, to ensure effective operation.	Inspection Reports PMS Reports No recordable incidents -Incident Report
2.18	Waste with potential to be windblown will be stored in covered containers in accordance with Marine Order 95 (Marine pollution prevention – garbage) 2013.	Waste Management plan Garbage record book HSE Inspections Incident Reports
2.19	Cargo will be packed, loaded, stowed and secured throughout each voyage in accordance with Marine Order 42 (Carriage, stowage and securing of cargoes and containers) 2016, where relevant.	Inspections Incident Reports
2.2	All lifting gear used for deployment and retrieval of equipment over the MODU and vessels will be load rated for the working load.	Rating Records Load records
2.1a	If deemed safe and effective to do so, support vessels can assist in the recovery of lost materials or waste.	Daily Reports
2.21b	Incidents of lost materials or waste overboard with potential to affect safe navigation will be reported to the AMSA JRCC and other marine users of the relevant operational area.	Incident Reports
2.22	Spill Containment Equipment: The contractor(s) management system will include provision to maintain spill containment and clean-up equipment aboard the MODU and vessels to prevent releases to the marine environment. This includes maintenance procedures for deck drainage systems, including the inspection and verification that all deck plugs and scuppers are installed correctly or that an active work permit is in place for their removal.	Vetting Records Assurance Review (Acceptance) HSE Inspections Daily Reports Incident Report
2.23	Bunkering/Bulk Liquid Transfer Procedure: Bunkering and bulk liquids will be transferred in accordance with Bunkering/Bulk Liquids Procedure(s) to reduce the risk of an unintentional release to sea during transfer. The procedures include standards for: <ul style="list-style-type: none"> • All transfer equipment used for bunkering operations will be certified with confirmed integrity through pressure tests and visual inspections of hoses and connections. Preventative maintenance performed on all fuel transfer pumps and valves • The use of dry break connections is mandated on all fuel transfer lines 	Vetting Records Assurance Review (Acceptance) Bunkering Records

		<ul style="list-style-type: none"> Performed under a PTW system with defined procedure that includes pre job integrity checks, communication protocols, monitoring of transfer, volume tracking, line up checks, emergency shut down procedures and spill incident reporting requirements. 	
	2.24	<p>All vessels will have a SOPEP/SMPEP (or equivalent appropriate to class) which details:</p> <ul style="list-style-type: none"> Response equipment available to control a spill event Review cycle to ensure that the Plans are kept up to date Testing requirements, including the frequency and nature of these tests Reporting requirements and a list of authorities to be contacted Activities to be undertaken to control the discharge of hydrocarbon (specifically, procedures to stop or reduce the flow of hydrocarbons to be considered in the event of tank rupture), and Procedures for coordinating with local officials. 	Vetting Records Assurance Review (Acceptance)
	2.25	The sulphur content of fuel used by the MODU and vessels will comply with Regulation 14 of MARPOL Annex VI (as appropriate to vessel class) in order to control SOx and particulate matter emissions, namely vessels will use very low sulphur fuel oil (VLSFO) (e.g. maximum 0.50% S VLSFO-DM, maximum 0.50% S VLSFO-RM).	Fuel Supply Contract Bunkering Receipts
	2.26	<p>Bulk Solid Transfer Procedure: Bulk solids will be transferred in accordance with Bulk Transfer Procedures to reduce the risk of an unintentional release to sea during tank venting. The procedures include standards for:</p> <ul style="list-style-type: none"> Certified equipment with checked integrity (e.g. hose and valves). Transfer process (e.g. safety, communication, monitoring, inventory, emergency shut down procedures, procedural documents, and spill incident details). 	MODU/Vessel inspection
	2.27	Fuel use will be recorded, and combustion emissions will be reported by the relevant facility operator in alignment with the National Greenhouse and Energy Reporting Act 2007 and/or associated international standards.	Bunkering Receipts Daily Report - Fuel Consumption Ship Energy Efficiency Management Plan NGERs Reports (or equivalent)
CM03: Marine and Coastal Users Consultation and Communication Plan	3.1	A Marine and Coastal Users Consultation and Communication Plan will be developed and implemented.	Consultation and Communication Plan Consultation Records
	3.2	Outcomes of the NOPSEMA assessment will be communicated to relevant persons.	Consultation and Communication Plan Consultation Records
	3.3	During the activity relevant persons will be informed about the progress of the activity and any changes at the frequency requested during the preparation of the EP, including a close-out letter at the conclusion of the activities.	Consultation and Communication Plan Consultation Records
	3.4	<p>Specific notifications will be provided as follows, prior to arrival in the operational areas and on departure, so the maritime industry is aware of petroleum activities:</p> <ul style="list-style-type: none"> AMSA's Joint Rescue Coordination Centre (JRCC) (minimum two days prior) - to distribute AusCoast Warning (Org ID: 8, Australian Maritime Safety Authority (AMSA), Event ID: 484, FB ID: 8, 9) Australian Hydrographic Office (AHO) (minimum four weeks prior) - to publish Notice to Mariners Org ID: 28, Department of Defence, Event ID: 540, FB ID: 159; Org ID: 8, Australian Maritime Safety Authority (AMSA), Event ID: 484, FB ID: 10) Marine and Safety Tasmania (minimum 4 weeks prior and general updates) (Org ID: 10, Maritime and Safety Tasmania, Event ID: 509, FB ID: 6, 63) Other relevant Authorities (minimum one week prior) Ocean Racing Club Victoria for activities scheduled for late-December to early-January (Org ID: 510, Ocean Racing Club of Victoria (ORCV), Event ID: 2617, FB ID: 62) 48-hour look-ahead provided every 24-hours prior to and during key periods of activity (i.e. transit of rig) (Org ID: 6, Tuna Australia, Event ID: 4255, FB ID: 464; Org ID: 6, Tuna Australia, Event ID: 4526, FB ID: 473; Org ID: 170, Atlantis Fisheries Consulting Group PTY. LTD, Org ID: 171, Southern Shark Industry Alliance (SSIA), Org ID: 11, South East Trawl Fishing Industry Association (SETFIA); Event ID: 1735; FB ID: 1026) 	Consultation and Communication Plan Consultation Records
	3.5	A Safe Operations Guide will be developed and implemented that details pre-activity and on-water communication processes, including SMS messages and radio communication on Channel 16. The guide will be developed based on feedback from consultation with other marine and coastal users during the preparation of the EP and adjustment protocol (see Event/Reg16b IDs below).	Safe Operations Guide Consultation Records
	3.6	<p>Arrangements in place with Fishing Associations to communicate with their distribution lists with details of where and when seabed survey, anchor pre-lay and drilling activities are scheduled to occur and regular updates on progress and forecast plans, and what controls (cautionary and exclusion zones) will be in place at set intervals:</p> <ul style="list-style-type: none"> 30 days prior to scheduled mobilisation for each activity 2 weeks prior to mobilisation for each activity 1 week prior to scheduled mobilisation for each activity At commencement of each activity Periodically during each activity 	Consultation and Communication Plan Consultation Records
	3.7	Cultural Heritage Identification and Documentation: Offer to fund a process whereby First Nations Persons can identify, record, and document cultural heritage values and sensitivities, such as sites, stories and songlines, within the Otway Exploration Drilling Program area to enhance Indigenous Protected Area (IPA) Sea Country Plans.	Consultation Records
	3.8	Indigenous Community Consultation: ConocoPhillips Australia will invite participation in the enhancement of the CHPP to First Nations cultural heritage advisors and indigenous communities through Registered Bodies Corporate and Registered Aboriginal Parties.	Consultation Records
CM04: Commercial Marine Operators (Otway) Adjustment Protocol	4.1	<p>An Adjustment Protocol will be developed:</p> <ul style="list-style-type: none"> In consultation with fishing associations and individual fishers to ensure that commercial fishers' claims can be assessed and compensated. Based on feedback from consultation with other commercial marine operators who identified they could be potentially impacted by the petroleum activity. <p>(Org ID: 137, Org ID: 138, Event ID: 3984, 4639 FB ID: 429, 1531; Org ID: 569, Tasmanian Climate Collective, Event ID: 3469, FB ID: 345; Org ID: 462, Mahina Bay Fishing Co Pty Ltd, Event ID: 3432, FB ID: 344; Org ID: 593, Event ID: 2512, FB ID: 168; Org ID: 50, Seafood Industry Tasmania (SIT), Event ID: 1821, FB ID: 152, 1305; Org ID: 433, Event ID: 2357, 2663, FB ID: 135, 1039; Org ID: 5, Colac Otway Shire Council, Event ID: 582, FB ID: 14; Org ID: 471, Richey Fishing Co Pty Ltd, Event ID: 536, FB ID: 12; Org ID: 490, Event ID: 507, FB ID: 3; Document ID: 3923, FB ID: 1237-1239, 1240).</p>	Adjustment Protocol Consultation Records
	4.2	ConocoPhillips Australia will work with other titleholders, fishing associations and fishers, to design an application process for compensation that minimises the potential for cumulative impacts to commercial fishers. (Org ID: 50, Tasmanian Seafood Industry Council (TSIC), Event ID: 1821, FB ID: 149, 150; Org ID: 433, Event ID: 2663, FB ID: 134; Org ID: 36, Victorian Fishing Authority (VFA), Event ID: 2522, FB ID: 87; Document ID: 3923).	Adjustment Protocol Consultation Records
	4.3	Communication: Each activity using the Otway Adjustment Protocol must give 28 days' notice to OMICC registered commercial fishers of the commencement of an activity. The notification will include information to support avoidance of the activity and information about how to make a claim.	Consultation Records

	4.4	Coverage: Adjustment can be claimed during a petroleum activity and for 6 months after the completion of each activity.	OMIC Records Consultation Records
	4.5	Claims Process: Subject to a claim being lodged, a suitably experienced/qualified independent person/organisation will be engaged by the titleholder as the assessor of the claim, in consultation with the claimant.	OMIC Records Consultation Records
	4.6	Commitment to Assess: Appropriately documented claims will be assessed, in accordance with the processes outlined in the OAP, and completed within 30 days of receipt of the required data.	OMIC Records Consultation Records
	4.7	Commitment to Pay: Successful claims will receive compensation within 30 days of the Outcome Notification being executed.	OMIC Records Consultation Records
CM05: Cultural Heritage Protection Program (CHPP)	5.1	Magnetometer survey data and seabed imagery will be reviewed during the seabed survey prior to collection of sediment samples, to support avoidance of ferric metal objects, including unidentified shipwrecks, aircraft and unexploded ordnance (UXO).	Site Survey Records Incident reports
	5.2	Seabed survey data and seabed imagery will be analysed by an underwater archaeologist and cultural heritage specialist to identify underwater cultural heritage values and sensitivities and inform protection priorities, measures and reporting requirements in accordance with the process defined in EP Figure 6-23. Seabed surveys and interpretation of data, including the development of the submerged paleo-landscape model, will be completed prior to the commencement of drilling for each location.	Seabed Survey Records Underwater Archaeology Report Incident Reports Underwater First Nations Cultural Heritage Report Incident Reports
	5.3	In the event that an Underwater Cultural Heritage site/ feature is identified, implement the Unexpected Finds Procedure set out in EP Section 10.3.5.1.	Compliance with Unexpected Finds Procedure
CM06: MODU Mooring Plan	6.1a	Seabed surveys will be conducted no later than 1 month before laying of MODU anchors (pre-lay or MODU anchoring) to identify: • Existing infrastructure (including UXOs and telecommunication cables). • Sensitive seabed features such as high relief outcrops and reefs (including circalittoral reefs) or sponge beds that are likely to be associated with site attached fish. • Submerged cultural heritage identified in CM05.	Seabed Survey Records
	6.1b	Seabed surveys data will be analysed by a suitably qualified benthic ecologist to identify sensitive seabed features, such as high relief outcrops and reefs (including circalittoral reefs) or sponge beds that are likely to be associated with site attached fish. benthic values and sensitivities and inform protection priorities, measures and reporting requirements. [EPS added in response to Matters: I13, I14 and I18]. Seabed survey data and seabed imagery will be analysed by a suitably qualified spatial benthic ecologist to identify benthic values and sensitivities and inform protection priorities, measures and reporting requirements. [EPS added in response to Matters: I13, I14 and I18]. If sensitive seabed features cannot be avoided for the safe mooring of the MODU well and mooring locations will be developed in consultation with the suitably qualified benthic ecologist to minimise impacts.	Seabed Survey Records Benthic Ecologist Report Mooring Plan
	6.2	ROV surveys will be undertaken prior to installing or removing the wellhead to minimise impacts to seabed features.	ROV Survey Records
	6.3	The Underwater Archaeology Report will be used in the development of the Mooring Plan to inform the well, location and of mooring array, to avoid interactions with identified shipwrecks, aircraft and unexploded ordnance (UXO).	Seabed Survey Records Underwater Archaeology Report Incident Reports
	6.4	API RP 2SK or ISO 19901-7: 2013 – Mooring Analysis: A mooring analysis will be undertaken prior to anchoring to ensure the anchor pattern and any support operations, including use of thruster assisted mooring, are appropriate for the environment, to minimise the risk of anchor slippage which can result in increased benthic disturbance.	Documented Mooring Analysis
	6.5	ISO 19901-7:2013 – Mooring Tensioning: Monitoring of mooring tension will be undertaken while the MODU is anchored on location, to identify potential for anchor slippage which can result in increased benthic disturbance.	Control room logbook/ Database Incident Reports
	6.6	Anchors will be located within the 2 km radius drilling area.	Mooring Plan Anchor position map
	6.7	Subsea equipment retrieval: Upon well abandonment, all subsea equipment shall be removed from sea floor, including positional transponders mounted on recoverable frames, with wellheads cut below mudline and retrieved to surface.	ROV Survey Drilling Report
	6.8	All mooring equipment will be retrieved from the sea floor within 3 months following the completion of the drilling campaign.	Drilling Report
	6.9	Anchors will be equipped with a surface buoy with a navigation light.	Operational Logs
6.10	AUSCOAST Warnings will be requested for issue by AMSA for anchors equipped with a surface buoy.	Consultation Records AUSCOAST Warning	
CM07: Light Management Plan	7.1	ConocoPhillips Australia will contract a suitably qualified specialist to develop and support the implementation of a Light Management Plan, as per the National Light Pollution Guidelines for Wildlife (CoA 2023), for the activity. This Plan will be in place 30 days prior to the commencement of activities within the Operational Areas. [Updated in response to Matters: B10, B11 and B12].	Light Management Plan Qualifications of SQS
	7.2	The Light Management Plan will be developed in consultation with seabird specialists at NRE Tasmania (Org ID: 33, Environment Protection Authority (EPA) Tasmania, Event ID: 2521, FB ID: 85).	Consultation Records
	7.3	Outwards facing lighting will be reduced to minimum levels, wherever practicable.	Vetting Records Assurance Review HSE Inspections
	7.4	Directions to minimise non-essential lights (e.g. close blinds, turn lights off when leaving a room etc.) during sensitive timing (e.g. OBP migration season) will be included in the MODU and vessel inductions and periodic toolbox meetings.	Induction HSE Meetings HSE Inspections
	7.5	A program for handling /rescuing grounded birds will be designed and implemented, and crew will be instructed to remain vigilant for seabird collisions	Light Management Plan Induction HSE Meetings
	7.6	Any observed/ discovered incidents will be recorded and reported in the environmental performance report.	HSE Inspections Incident Reports
	7.7	ConocoPhillips Australia will work with other petroleum titleholders in the Otway Basin with the aim of minimising the potential for cumulative impacts associated with light emissions, should activity timings overlap biologically important periods for light sensitive species.	Light Management Plan Consultation Records
			Light Management Plan

	7.8	Report observation, incidents, and opportunities for improvement regarding light management and bird interactions to other Otway Titleholders.	MoC Register/Reports Consultation Records
CM08: Fauna Management Plan (FMP)	8.1	ConocoPhillips Australia will implement a Fauna Management Plan (FMP) for the activity	Fauna Management Plan
	8.2	The COPA Environmental Officer will convene daily operations meetings between observation platform leads to review data, inform ongoing operations, and trigger escalation of adaptive management measures (including the requirement to convene the Whale Expert Panel (WEP).	Daily Meeting Minutes
	8.3	A WEP will be engaged with the purpose of: <ul style="list-style-type: none"> • Providing oversight of aerial survey design • Advising on adaptive management plan actions to be implemented to ensure EPOs are achieved. Experts must have: <ul style="list-style-type: none"> • 10 years of relevant marine mammal experience • Track record of publications or research outputs relevant to the specific species • An understanding of offshore oil and gas operations. 	CVs of WEP members Minutes of WEP meetings/discussions Records of adaptive management actions taken show WEP advice has been implemented
	8.4	At all times, There will always be two MFOs will be stationed on: <ul style="list-style-type: none"> • The seabed survey vessel-whilest seabed surveys are occurring. • The MODU support vessels whilst drilling and VSP activities are occurring. 	Daily Report CVs of MFOs MFO Report showing MFO periods of duty and sightings
	8.5	Passive acoustic monitoring platforms will be validated prior to being relied upon for whale detection during drilling and VSP activities. If a whale is detected visually that is not detected acoustically, systems are not considered to be validated and will be a supplementary form of detection only. Even if not completely validated, passive acoustic systems will continue to be used at nighttime to reduce risks further.	Daily Report Passive acoustic detection validation results. PAM Report
	8.6	Aerial surveys are implemented to inform the level of risk to species undertaking biologically important behaviours in the broader region. The design and frequency of aerial surveys will be informed by the WEP.	Records show aerial surveys are undertaken in accordance with WEP recommendations Records show that whale expert panel is engaged and advice regarding survey design has been implemented.
	8.7	The minimum frequency of aerial surveys during drilling activities will be as follows: <ul style="list-style-type: none"> • A minimum of 2 flights prior to commencement of firm (2) well program to be scheduled by the WEP. • A minimum of 2 flights prior to commencement of optional (4) well program to be scheduled by the WEP A minimum of 4 flights per well (assuming 30-90 days per well) to be scheduled by the WEP.	Aerial Survey Reports
	8.8	Pre-mobilisation: If blue whales are detected during a pre-mobilisation aerial survey, a vessel based survey of the target operational area will be undertaken prior to moving the MODU on station.	Aerial survey records
	8.9	Adaptive Management: A risk review by the WEP will be triggered to inform ongoing operations, if: <ul style="list-style-type: none"> • There are > 3 blue whale sightings in the previous 24 hrs. • There are >1 blue whale or SRW sighting in preceding 12 hours of daylight. 	MMO records Operational records demonstrate adaptive management practices have been followed Records show advice of WEP was followed
	8.10	Preplay: If a blue whale or southern right whale is observed/detected within the AAZ while the vessel is deploying an anchor during preplay operations, the vessel will do the following if safe to do so: <ul style="list-style-type: none"> • Reduce thrusters; and/or • Move away from the whale. Once the anchor is deployed the next anchor can be deployed if: <ul style="list-style-type: none"> • The blue whale or southern right whale is observed leaving the AAZ; or • No blue whale or southern right whale is observed for 60 min within the AAZ. 	MMO sightings Operational records
	8.11	Resupply: Resupply will only commence during daylight hours unless essential for operational safety reasons.	Records demonstrate planned resupply occurs during daylight hours only; or documents safety requirement.
	8.12	Resupply: During resupply, if a blue whale or southern right whale are observed/detected within the AAZ during MODU resupply, the vessel will do the following if safe to do so: <ul style="list-style-type: none"> • Reduce thrusters. • Cease resupply and move away, maintaining a distance of 500 m to 1 km from the whale/s as detailed in Section 4 of the FMP (Vessel Whale Interaction). 	MMO sightings Operational records
	8.13	Prestart Observations: Minimum pre-start observation periods will apply as follows: <ul style="list-style-type: none"> • Seabed survey and vessels on DP: 30 minutes • Drilling and VSP: 60 minutes 	MMO records
	8.14	Start-up Delays: Start-up delays apply to all activities, as follows: <ul style="list-style-type: none"> • Seabed survey, vessels of DP and VSP – 30 minute start-up delay, or until whale is observed leaving the AAZ • Drilling: 60 minutes, or until the whale is observed leaving the AAZ. 	MMO records
	8.15	Soft-Starts: The VSP acoustic source will be ramped up over 30 minutes to allow fauna time to move away from the source.	MMO records Daily Report
	8.16	Seabed Survey: A distance of 500 m from any whale will be maintained at all times while the source is active. If a 500 m distance cannot be maintained the source will be shut down.	MMO records.
CM09: Drilling Program	9.1	Prior to the commencement of the drilling campaign, an assurance check will be undertaken in accordance with the Management of Change Procedure.	MoC Register MoC Reports
	9.2	A cuttings management system with solids control equipment will be in place that uses a closed circulating system to reduce the concentration of drilling mud on cuttings prior to discharge, thereby reducing the total volume of mud discharged to sea. <ul style="list-style-type: none"> • The shale shakers will be fitted with screens that meet API standards for particle size cut points. 	Solids control daily reports Daily Drilling reports

		<ul style="list-style-type: none"> Centrifuges will be used as required to remove additional finer drilled cuttings/solids that are too small for the shale shakers. 	
9.3	Drilling Fluids Control Program - Inventory Control: Only residual water-based fluid systems, brine, completion chemicals, cement and cement spacer within MODU mud pits and surface tanks that are no longer required will be diverted overboard.		Daily drilling reports
9.4	Drilling Fluids Inventory Control: Unusable inventories of bulk cement, drilling fluid solid additives, brine and drill water on-board the MODU will be managed according to the procedure.		Daily mud reports
9.5	Drilling Fluids Inventory Control: Inventory will be recycled for reuse before being disposed of overboard, where deemed suitable.		Drilling fluids end of well report
9.6	<p>Cementing Procedure: A Cementing Procedure will be in place to minimise the amount of cement discharged to the marine environment, including:</p> <ul style="list-style-type: none"> Provision to mix only enough cement to complete the cementing operation with allowance for loss to formation and the monitoring and reconciliation of used quantities of cement against planned quantities for each cementing operation. 		<p>Documented cementing procedure</p> <p>Cementing Report</p> <p>Daily drilling reports</p> <p>Well management standards</p>
9.7	<p>The following will be implemented for unused bulk powders:</p> <ul style="list-style-type: none"> Unused bulk stocks of cement, bentonite and barite retained on the MODU to be used for subsequent ConocoPhillips Australia drilling activities, where the current well is not ConocoPhillips Australia's last well. Unused bulk powder stocks of cement, bentonite and barite retained on the MODU to be used by the next consortium titleholder who takes the MODU from ConocoPhillips Australia. Surplus unused bulk powder stocks of cement and bentonite will be reduced through placement of non-barrier plugs within the final well bore. No discharge of unused bulk powder stocks of barite, cement and bentonite with these returned to shore. 		<p>Monitoring, reconciliation and backloading records</p> <p>End of Well Report</p> <p>Completed decision log</p> <p>Daily drilling report</p> <p>Bulk/barge report</p>
9.8	Where losses are anticipated, drilling fluid will contain an engineered bridging agent to create a seal at the drilling fluid/formation interface to reduce the likelihood of fluid losses (Org ID: 13, King Island Marine Research, Event ID: 3129, Reg16b: 290, 291, 293).		<p>Daily drilling reports</p> <p>Daily mud reports</p> <p>Drilling fluids end of well report</p>
9.9	The BOP will be routinely function and pressure tested in accordance with Industry Standard API-53: 2018, manufacturer's specifications and in alignment with Drilling Contractors preventative maintenance system, to minimise discharges of dilute water-soluble hydraulic fluid.		<p>BOP maintenance records</p> <p>PMS Records</p>
9.10	Pre-operational function and pressure tests of the BOP will be conducted and may be witnessed by additional third-party prior to campaign.		BOP third party verification records
9.11	VSP equipment will be operated in accordance with manufacturer's instructions and ongoing preventative maintenance to ensure efficient operation.		<p>Inspection Reports</p> <p>PMS Reports</p>
9.12	Wireline extended reservoir evaluation, with associated venting of reservoir gas, may be conducted if suitability of method for application to specific reservoir is confirmed during the drilling program.		<p>Daily drilling reports</p> <p>Vented volumes</p>
9.13	<p>During well testing activities, if non-flammable fluids (potentially including produced water) are not flared, they will be processed through the well test water treatment package prior to discharge to the environment.</p> <ul style="list-style-type: none"> Non-flammable fluids (potentially including produced water) discharged to the marine environment achieves discharge specification of <30 ppm oil in water. Non-flammable fluids not meeting the 30 ppm oil in water criteria which cannot be cleanly flared will be stored in tanks for later onshore disposal. 		<p>Daily drilling reports</p> <p>Drilling fluids end of well report</p>
9.14	Compliance with Drilling Program Activity Limitations is confirmed as part of the Authorization for Expenditure (AFE) process, prior to operations.		AFE checklist completed for each well documents well location, water depth and compliance with Activity Limitations.
CM10: Well Testing Program	10.1	Flaring will be limited to a maximum of 120 hours per well.	Operational Log
	10.2	For each well test, the initial flaring event will commence during daylight hours to reduce the impact of the initial event. However, the timing of subsequent events at each well will be determined by operational safety and testing requirements.	Operational Log
	10.3	Prior to the commencement of the initial flaring event at each well, the area extending from the tip of the flare will be visually confirmed clear of birds.	<p>Operational Log</p> <p>Incident Reports</p>
	10.4	Flaring durations and hydrocarbon volumes flared will be recorded and combustion emissions reported by the relevant facility operator in alignment with the National Greenhouse and Energy Reporting Act 2007 and/or associated international standards.	<p>Operational Log</p> <p>Flared volumes</p> <p>NGERs Reports (or equivalent)</p>
	10.5	No flaring within VIC/P79-North during 2-week period of shearwater fledging, as advised by the relevant state government department seabird specialist.	Operational Log demonstrates compliance with AL#4.4.1 based on timing as documented in Consultation Records
CM11: Procurement Vetting Process	11.1	A flaring system with air compressors will be used to atomise hydrocarbons to minimise smoke during combustion and aid in the reduction of atmospheric emissions.	<p>Minimum equipment requirements</p> <p>Vetting Records</p> <p>Assurance Review (Acceptance)</p>
	11.2	A minimum standard for the destruction efficiency of the flare will be specified in the minimum equipment requirements.	Minimum equipment requirements
	11.3	VSP equipment will be inspected prior to deployment and confirmed operation in accordance with manufacturer's specifications.	<p>Inspection Reports</p> <p>Vetting Records</p> <p>Assurance Review</p>
	11.4	Third party equipment used to treat planned discharges, e.g. centrifuges, cuttings driers, etc will be verified as fit for purpose.	<p>Vetting Records</p> <p>Assurance Review (Third-party Acceptance)</p>
	11.5	The seabed survey contract will require the collection of representative sediment samples from grab samples collected to validate geophysical survey data, with storage and transport onshore for benthic analysis. (Org ID: 9, University of Tasmania (UTAS), Event ID: 43, FB ID: 7; Org ID: 524, Wilderness Society, Event ID: 3480, FB ID: 382, 384, 387; Org ID: 111, Australian Marine Conservation Society, Event ID: 3785, FB ID: 357).	<p>Seabed Survey Contract</p> <p>Site Survey Records</p>

			Analysis Reports
	11.6	During procurement of aviation services, an assessment of operational considerations to prevent bird collisions will be conducted.	Procurement vetting records Incident Reports
	11.7	Positional transponders with recoverable frames will be specified in the scope of work for the rig positioning contract to facilitate removal from the seafloor.	Procurement vetting records Incident Reports
	11.8	Compliance with Seabed Survey Activity Limitations is confirmed as part of the pre-mobilisation process for the seabed surveys, prior to commencement.	Pre-mobilisation checklist completed for each seabed survey location documents location, water depth and compliance with Activity Limitations.
CM12: General and Hazardous Chemical Management Procedures	12.1	Chemical Management Procedures for general and hazardous chemicals and hydrocarbons, will be in place, including requirements for: <ul style="list-style-type: none"> • Chemical selection process • Safety data sheet (SDS) being available for all chemicals • Storage, handling and use • Deck drain management • Inspections • Non-compliances and incidents • Process to isolate hazardous chemicals remaining on board from previous operations. 	HSE Inspections Vetting Records Assurance Review (Acceptance) Incident Reports
	12.2	A Chemical Selection Procedure will be in place to ensure chemicals that have the potential to be discharged to the marine environment are rated Gold/Silver/D or E through Oslo and Paris Conventions (OSPAR) and Offshore Chemical Notification Scheme (OCNS) or have a complete risk assessment.	Chemical Management Procedure Completed and approved chemical assessment Approved Chemical Register Incident Reports
	12.3	Materials and equipment that have the potential to spill onto the deck or marine environment will be stored in a manner to reduce the potential for a spill.: <ul style="list-style-type: none"> • Storage containers closed when the product is not being used. • Storage containers managed in a manner that provides for secondary containment in the event of a spill or leak. • Storage containers labelled with the technical product name as per the SDS. • Spills and leaks to deck, excluding storage bunds and drip trays, immediately cleaned up. • Storage bunds and drip trays do not contain free flowing volumes of liquid. 	HSE Inspections Daily Reports Incident Reports
	12.4	Barite Quality Standard: Barite will adhere to the IFC EHS guidelines (2015) effluent levels of 1 mg/kg of Hg (dry weight) and no more than 3 mg/kg of Cd (dry weight). (Org ID: 13, King Island Marine Research, Event ID: 3129, FB ID: 283, 304, 313, 333)	Testing records or supplier certificates
CM13: Oil Pollution Emergency Plan (OPEP)	13.1	Emergency spill response capability will be maintained in accordance with the accepted OPEP. (Org ID: 111, Australian Marine Conservation Society, Event ID: 4153, FB ID: 455)	Outcomes of internal audits and tests demonstrating preparedness
	13.2	Spill response will be implemented in accordance with relevant EPOs and EPS in the accepted OPEP.	EMT/IMT Log Incident Action Plan
CM14: Operational and Scientific Monitoring Program (OSMP)	14.1	Operational and scientific monitoring capability will be maintained in accordance with OSMP Table 2-1 and Table 2-2.	As per OSMP
	14.2	One month prior to the commencement of drilling a review of the contracted OSMP provider(s) capability will be undertaken to ensure that the OSMP requirements can be met.	Capability Review
	14.3	The contracted OSMP provider(s) capability to meet the requirements detailed in the OSMP will be tested prior to commencing drilling.	Capability Test Report
	14.4	During drilling the contracted OSMP provider(s) will provide a monthly report to show that capability as detailed in the OSMP is maintained.	OSMP Monthly Report
CM15: Well Design and Delivery Process (WDDP)	15.1	Well construction and abandonment processes will be implemented in accordance with the ConocoPhillips Well Engineering Design and Construction Standards and Manuals to manage operational risks associated with drilling to ALARP, including, but not limited to: <ul style="list-style-type: none"> • Well Construction and Intervention Standard • Well Management Standard • Well Control Manual • Casing and Tubing Design Manual • Well Design and Delivery Process Manual • Well Integrity Manual • Wells Competency Management Manual 	Well Design and Delivery Process Records Well Acceptance Criteria Accepted WOMP Daily Reports
	15.2	Well Design and Plan Approval: All aspects of risk profiling, well construction and abandonment design will be peer reviewed and approved by ConocoPhillips management at each stage.	Well Design and Delivery Process Records
CM16: Source Control Emergency Response Plan (SCREP), inclusive of Relief Well Plan	16.1	30 days prior to campaign commencement a register of suitable relief well MODU's will be compiled and then maintained and updated on a 14 day basis.	Relief well capability register confirms MODU availability
	16.2	Emergency response capability to implement an effective well kill operation within 90 days will be maintained in accordance with the SCERP.	Outcomes of internal audits and tests/drills demonstrating preparedness
	16.3	Relief Well Design Assessment (pre-drilling): An assessment to identify and screen relief well spud locations will be conducted, at a minimum, two months prior to the planned commencement of drilling of each well covered under this EP, to reduce the time taken to plan and execute a relief well, thereby reducing environmental impacts.	Seabed surveys of relief well locations Documented campaign relief well plan developed in line with OGUK guidance prior to drilling.
16.4	At a minimum of three months prior to the planned commencement of drilling of each well covered under this EP, a pre-purchase or access agreement will be in place for relief drilling supplies, including long-lead items such as	Access Agreement	

16.4	casing, casing shoes and wellhead equipment, to reduce relief well drilling times reducing environmental impacts.	Equipment inventory
16.5	At a minimum of three months prior to the planned commencement of drilling of each well covered under this EP, a contract will be in place to support hot stab and/or direct well intervention via ROV (via either ROV available on rig and/or additional ROV to be supplied) using source control equipment and trained personnel from contracted company.	AMOSC SFRT membership ROV Contract
16.6	After the Surface (13-3/8") casing has been run, cemented and pressure tested on each well, a ConocoPhillips Drilling and Completions Source Control Branch Director will be identified and confirmed as available to be activated within 2 hours, should activation of the IMT occur	IMT Roster during activity Training and Exercising
16.7	After the Surface (13-3/8") casing has been run, cemented and pressure tested on each well, a ConocoPhillips Drilling and Completions Source Control Team will be identified and confirmed as available to be activated and mobilised within 24 hours, should activation of IMT occur.	IMT Roster during activity Training and Exercising
16.8	At a minimum of three months prior to the planned commencement of drilling of each well covered under this EP, contract(s) and memorandums of understanding (MOU) will be in place for source control personnel.	Global agreement with Well Control Specialist Signed APPEA MOU
16.9	After the Surface (13-3/8") casing has been run, cemented and pressure tested on each well, Well Control Specialists will be identified and confirmed accessible remotely within 24 hours with mobilisation within 72 hours, should activation of the IMT occur, to support diagnosis of well condition and development of remedial action options.	Training and Exercising
16.10	At a minimum of three months prior to the planned commencement of drilling of each well covered under this EP, membership will be in place for the AMOSC Subsea First Response Toolkit (SFRT), which provides for surveillance, debris clearance and trained responders, as well as subsea dispersant application.	AMOSC SFRT membership

CIA Scoping Tool

Environmental Component	Sub-Component	Environmental Aspect (yellow = drilling specific)								CIA Scoping				Cumulative Cause-effect Pathway			
		Physical Presence	Seabed Disturbance	Artificial Light - Operational	Artificial Light - Flaring	Atmospheric Emissions	Underwater Sound - Continuous	Underwater Sound - Impulsive	Routine Discharges	Drilling Discharges	Acceptable Levels (Effect) Ecological integrity and biodiversity conservation (Temporary/reversible/recoverable, small scale and/or low intensity) Assessing scale and nature	Potential for Cumulative Impact - Spatial Extent	Potential for Cumulative Impact - Temporal Extent		Predictability and Certainty	Scoping Assessment Outcome	
Physical Environment	Water Quality		✓						✓	✓	Temporary, small-scale and recoverable impacts.	N - Limited to individual activity discharge location	N - Limited to duration of individual activity	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance, drilling and routine discharges (Sections 6.3, 6.8 and 6.9) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Impacts to water quality from COPA's and other potential activities are predicted to rapidly disperse given the open ocean environment and prevailing currently within 500 m to 2 km of the discharge, thus there is no potential to accumulate over spatial or temporal scales.	None identified	
	Sediment Quality		✓							✓	Temporary, small-scale and recoverable impacts.	N - Limited to individual activity discharge location	N - Limited to months - year after individual activity	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance and drilling discharges (Sections 6.3 and 6.8) which highlights the limited spatial and temporal nature of the aspects. Successive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified but impacts not material. No impacts to sediment quality are predicted for seismic surveys conducted by other operators. Impacts to sediment quality from COPA's and other drilling activities are predicted to be localised within 500 m of each well. Though there is the potential for an increase in the area of potential impact as each area is very small (500 m) material impacts are not predicted.	Identified but impacts not material. No further assessment required.	
	Air Quality					✓						Temporary, small-scale and recoverable impacts.	N - Limited to individual activity discharge location	N - Limited to duration of individual activity	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of atmospheric emissions (Section 6.5) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Impacts to air quality from COPA's and other potential activities are predicted to be localised and atmospheric emissions will rapidly disperse to background levels close to the emissions source given the open ocean environment and prevailing wind. Emissions are not predicted to affect the achievement of the National Environmental Protection Measure for Ambient Air Quality (NEPM AQQ) (NEPC 2021) protection goals., with no potential to accumulate over spatial or temporal scales.	None identified
	Climate					✓						Small-scale and low intensity impacts.	N - Global climate	N - Indeterminable	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of atmospheric emissions (Section 6.5) which highlights the limited spatial and temporal nature of the aspects. Although GHG emissions from COPA's and other reasonably foreseeable activities will add to the global atmospheric levels of GHG emissions, the quantities estimated to be released are insignificant on a global scale.	None identified
	Ambient Light - Operational			✓								Temporary, small-scale and recoverable impacts.	Y - Bioregion, BIAs and biologically important behaviours for sensitive species	Y - Consecutive activities, and seismic and single drilling operation may occur concurrently	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of light emissions (Section 6.4) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified. Although changes in ambient light are restricted to typically 20 km radius of individual activities, activities may occur consecutively over a number of years within the Otway Basin and seismic and drilling at a single location have the potential to occur concurrently	Identified from COPA's and other reasonably foreseeable activities with further assessment required to determine if impacts are material.

Ambient Light - Flaring			✓	✓							Temporary, small-scale and recoverable impacts.	N - Only single drilling operation at any one time	Y - Consecutive activities if others are flaring in similar location	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of light emissions (Section 6.4) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified. There is potential for cumulative impacts depending on location of activities and sensitive receptors from COPA's and other potential activities. Although flaring light impacts are restricted to typically 50 km radius of individual short-term operations (max. 120 hours per well), flaring may occur consecutively over a number of years within the Otway Basin.	Identified from COPA's and other potential activities with further assessment required to determine if impacts are material.
Ambient Sound							✓	✓			Temporary, small-scale and recoverable impacts.	Y - Bioregion, BIAs and biologically important behaviours for sensitive species	Y - Consecutive activities Seismic and single drilling operation may occur concurrently	Moderate for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of underwater sound - continuous and impulsive (Sections 6.6 and 6.7) which highlights the limited spatial and temporal nature of the aspects. There is potential for successive and additive cumulative impacts depending on location and timing of activities and sensitive receptors from COPA's and other reasonably foreseeable activities. Although sound impacts are restricted to within typically 10s of kms around individual activities, activities may be occurring consecutively over a period of time and seismic and drilling (at a single location) have the potential to occur concurrently.	Identified from COPA's and other reasonably foreseeable activities with further assessment required to determine if impacts are material.
Benthic Habitats and Communities		✓								✓	Temporary, small-scale and recoverable impacts.	N - Limited to individual activity area	N - Limited to weeks-months after individual activity	High in individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance and drilling discharges (Sections 6.3 and 6.8) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. The area of impact is relatively small compared to the extent of the distribution of benthic habitats and associated benthic fauna found within the Otway Basin. Widespread changes to the benthic environment or ecosystem functioning or integrity are not predicted. No overlap with threatened ecological communities. Overlap with Zeehan AMP, which has benthic habitat as a value, only occurs one activity.	None identified
Coastal Habitats and Communities											N/A for planned activities. (No impact to coastal areas from planned drilling operation impacts).					None identified
Plankton							✓	✓	✓	✓	Temporary, small-scale and recoverable impacts.	N - Limited to individual activity area	N - Recovery days post activity	Moderate for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of routine discharges, drilling discharges plus underwater sound - continuous and impulsive (Sections 6.6, 6.7, 6.8 and 6.9) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Discharges to the water column are not predicted to impact water quality at a cumulative scale and therefore will not impact plankton at an ecological integrity level. Continuous noise from drilling and vessel operation is not predicted to impact plankton. The cumulative impact of impulsive sound from consecutive seismic operations has been assessed and controlled in relevant EPs. Impacts from VSP are short term (<20 hours per well and nor predicted to result in impacts at scale to contribute to cumulative impacts.	None identified
Invertebrates		✓					✓	✓		✓	Temporary, small-scale and recoverable impacts.	N - Limited to individual activity with exception of multiple seismic operations	N - Limited to weeks-months after individual activity	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance, drilling discharges plus underwater sound - continuous and impulsive (Sections 6.3, 6.6, 6.7 and 6.8) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Continuous noise from drilling and vessel operation and VSP is not predicted to impact invertebrates. The cumulative impact of impulsive sound from consecutive seismic operations has been assessed and controlled in relevant EPs.	None identified

Ecological Environment	Fish and Sharks		✓								Not inconsistent with EPBC Act Management Plans, and Recovery Plans. Temporary, small-scale and recoverable impacts.	N - Limited to individual activity with exception of multiple seismic operations	N - Periods of biologically important behaviours for sensitive species	High for individual and cumulative impact sense.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance, operational and drilling discharges plus underwater sound - continuous and impulsive (Sections 6.3, 6.6, 6.7, 6.8 and 6.9) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Underwater sound from drilling is predicted to be localised to within 190 m for recoverable injury and TTS for fish and sharks and within 450 m for VSP. The area of impact from concurrent seismic and drilling activities is small compared to the extent of the distribution of fish and shark species. The area of impact from concurrent seismic and drilling activities is small compared to the white shark distribution BIA, but is considered moderate for the foraging BIA. However, seismic survey and drilling operations with the potential to affect the foraging BIA in the northern extent of VIC/P79 are mutually exclusive and cannot occur concurrently. Sound impacts are not identified as a threat within the Recovery Plan for the White Shark (Carcharodon carcharias) (DSEWPac 2013a).	None identified
	Birds			✓	✓		✓	✓			Not inconsistent with EPBC Act Management Plans, and Recovery Plans. Temporary, small-scale and recoverable impacts.	Y - BIAs for sensitive species (Bioregion)	Y - Periods of biologically important behaviours for sensitive species	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of ambient light - operational and flaring, plus underwater sound - continuous and impulsive (Sections 6.4, 6.6 and 6.7) which highlights the limited spatial and temporal nature of the aspects. There is potential for additive cumulative impacts associated with light depending on location of activities and sensitive receptors from COPA's and other reasonably foreseeable activities with similar aspects. There is no cumulative effect pathway for underwater sound with the consequence of underwater sound on birds from drilling activities assessed as negligible. Although changes in ambient light are restricted to typically 20 km radius of individual activities, activities may be occurring consecutively over a number of years throughout the region and seismic and drilling at one location have the potential to occur concurrently.	Identified from COPA's and other reasonably foreseeable activities with further assessment required to determine if impacts are material.
	Marine Reptiles			✓	✓		✓	✓			Not inconsistent with EPBC Act Management Plans, and Recovery Plans. Temporary, small-scale and recoverable impacts.	N - No BIAs or critical habitat	N - No periods of biologically important behaviours for sensitive species	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of ambient light - operational and flaring, plus underwater sound - continuous and impulsive (Sections 6.4, 6.6 and 6.7) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Individuals in the area are expected to be transient, with no BIAs, critical habitat or biologically important behaviours within the Otway Basin. Lighting doesn't impact inwater navigation or behaviours and impacts from noise will be temporary and recoverable.	None Identified
	Marine Mammals						✓	✓	✓	✓	Not inconsistent with EPBC Act Management Plans, and Recovery Plans. Temporary, small-scale and recoverable impacts.	Y - BIAs for sensitive species (Bioregion)	Y - Periods of biologically important behaviours for sensitive species	Moderate for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of routine discharges, drilling discharges plus underwater sound - continuous and impulsive (Sections 6.6, 6.7, 6.8 and 6.9) which highlights the limited spatial and temporal nature of the aspects. There is potential for additive cumulative impacts associated with underwater sound depending on location of activities and sensitive receptors from COPA's and other reasonably foreseeable activities with similar aspects. Although sound impacts are restricted to within typically 10s of kms around individual activities, activities may be occurring consecutively over a period of time and seismic and drilling at one location have the potential to occur concurrently.	Identified underwater sound from COPA's and other reasonably foreseeable activities as a cumulative cause-effect pathway with further assessment required to determine if impacts are material.
	Conservation Values and Sensitivities		✓	✓	✓	✓	✓	✓	✓	✓	Not inconsistent with SE Marine Parks Network Management Plan. Temporary, small-scale and recoverable impacts.	N - Zeehan AMP	Y - Periods of biologically important behaviours for conservation values	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance, atmospheric emissions, underwater sound - continuous and impulsive and drilling discharges (Sections 6.3, 6.5, 6.6, 6.7 and 6.8) which highlights the limited spatial and temporal nature of the aspects. The Zeehan Marine Park is overlapped by EMBA's for three proposed activities, including the COPA drilling project. See individual ecological receptors above for assessment of conservation values of the Zeehan Marine Park which include benthic habitats that supports animal communities and invertebrates, seabirds, the white shark and migrating blue whales and humpback whales.	Identified for some light sensitive bird species and underwater sound sensitive whale species from COPAs and other reasonably foreseeable activities with further assessment required to determine if impacts are material.

Socio-economic Environment (Other marine and coastal users)	Coastal Communities and Onshore Tourism Activities	✓		✓	✓								Temporary, small-scale and low intensity impacts.	N - Not predicted to see multiple activities from single vantage point (King Island, Victorian coast)	Y - May be able to see different activities over time from single vantage point (King Island, Victorian coast)	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users and artificial light - operational and flaring (Sections 6.2 and 6.4) which highlights the limited spatial and temporal nature of the aspects. There is potential for additive cumulative impacts associated with visual impact depending on location of activities and sensitive receptors from COPA's and other reasonably foreseeable activities with similar aspects but impacts not material. The likelihood of visibility of multiple activities from a single vantage point is considered low given the distances offshore it is not predicted that MODU and vessel would be distinguishable from other existing vessel traffic.	Identified from COPA's and other potential activities but impacts not material. No further assessment required.
	Offshore Petroleum Activities	✓											Temporary, small-scale and low intensity impacts.	N	N	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users (Section 6.2) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified but impacts not material. Other activities are scheduled and/or operate within their own exclusions zones/petroleum titles. Notice to mariners will provide advanced warning and opportunity to plan transit route. At most avoidance of a single seismic survey vessel and towed equipment, and a single drilling location at any given time with minimal impact.	Identified from COPA's and other reasonably foreseeable activities but impacts not material. No further assessment required.
	Offshore Renewable Energy Activities	✓											Temporary, small-scale and low intensity impacts.	N	N	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users (Section 6.2) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. There are no reasonably foreseeable future projects or activities in the offshore Otway Basin.	None Identified
	Defence Activities	✓	✓										Temporary, small-scale and low intensity impacts.	Y - Displacement from concurrent and consecutive seismic and drilling areas	Y - Displacement from concurrent and consecutive seismic and drilling areas	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users and seabed disturbance (Section 6.2 and 6.3) which highlights the limited spatial and temporal nature of the aspects. Successive and additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified but impacts not material. Industry standard controls in place such as notice to mariners will provide advanced warning and opportunity to plan transit route. At most avoiding a single seismic survey vessel and towed equipment, and a single drilling location at any given time with minimal impact. Impacts to maritime archaeological heritage are not predicted from seismic surveys. Drilling activities required to undertake seabed surveys prior to seabed disturbance. Impacts to UXO are not a planned event and therefore cumulative impacts are not predicted.	Identified from COPA's and other reasonably foreseeable activities but impacts not material. No further assessment required.
	Shipping	✓											Temporary, small-scale and low intensity impacts.	Y - Displacement from concurrent and consecutive seismic and drilling areas	Y - Displacement from concurrent and consecutive seismic and drilling areas	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users (Section 6.2) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified but impacts not material. The area of impact is small compared to the area available for shipping. Industry standard controls in place such as notice to mariners will provide advanced warning and opportunity to plan transit route. At most avoiding a single seismic survey vessel and towed equipment, and a single drilling location at any given time with minimal impact.	Identified from COPA's and other reasonably foreseeable activities but impacts not material. No further assessment required.
	Marine Tourism	✓											Temporary, small-scale and low intensity impacts.	Y - Displacement from concurrent and consecutive seismic and drilling areas	Y - Displacement from concurrent and consecutive seismic and drilling areas	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users (Section 6.2) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other potential activities identified but impacts not material. The area of displacement is small compared to area available for tourism. Industry standard controls in place such as notice to mariners will provide advanced warning and opportunity to plan transit route. At most avoiding a single seismic survey vessel and towed equipment, and a single drilling location at any given time with minimal impact.	Identified from COPA's and other reasonably foreseeable activities but impacts not material. No further assessment required.
	Recreational Diving and Surfing							✓	✓				N/A for planned activities. No affect to divers and surfers from planned drilling operations are predicted.					

	Recreational Fishing	✓									Temporary, small-scale and low intensity impacts.	Y - Displacement from concurrent and consecutive seismic and drilling areas on shelf area	Y - Displacement from concurrent and consecutive seismic and drilling areas	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users (Section 6.2) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified but impacts not material. The area of displacement is small compared to area available for recreational fishing. Industry standard controls in place such as notice to mariners will provide advanced warning and opportunity to plan activities. At most avoiding a single seismic survey vessel and towed equipment, and a single drilling location at any given time with minimal impact.	Identified from COPA's and other reasonably foreseeable activities but impacts not material. No further assessment required.
	Commercial Fisheries	✓	✓				✓	✓			Affected persons will not be worse off because of the activity.	Y - Displacement from concurrent and consecutive seismic and drilling areas	Y - Displacement from concurrent and consecutive seismic and drilling areas	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users, seabed disturbance plus underwater sound - continuous and impulsive and drilling discharges (Sections 6.2, 6.3, 6.6 and 6.7) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified but impacts not material. Displacement of fishers operating in fisheries with spatial extent that may be overlapped by a number of offshore activities, i.e. displaced by multiple exclusion zones (MODU and seismic survey) or different exclusion zone over time. Although displacement impacts are restricted to within typically 2 kms around individual activities, drilling may be occurring consecutively over a period of time and seismic and drilling at one location have the potential to occur concurrently. Minor behavioural disturbances are predicted to commercial fish species from underwater sound and cumulative impacts are not predicted.	Identified from COPA's and other reasonably foreseeable activities and further assessment required to determine if impacts are material.
Cultural Environment	First Nations Peoples Heritage including but not limited to Sea Country, Song Lines and totemic species.	✓	✓	✓	✓		✓	✓	✓		Not inconsistent with Indigenous Protected Area Plans. Temporary, small-scale and recoverable impacts.	Y - Sea Country	Y - Over term of activities	Moderate in individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of interference with other marine and coastal users, seabed disturbance, artificial light -operational and flaring, underwater sound - continuous and impulsive plus drilling discharges (Sections 6.2, 6.3, 6.4, 6.5, 6.6 and 6.8) which highlights the limited spatial and temporal nature of the aspects. Additive cumulative impact cause-effect pathway from COPA and other reasonably foreseeable activities identified. Drilling and other activities may have the potential to cumulatively affect cultural values and sensitivities in the region.	Identified from COPA's and other reasonably foreseeable activities and further assessment required to determine if impacts are material in relation to light sensitive and underwater sound sensitive species.
	Maritime Archaeological Heritage		✓								No disturbance of maritime cultural heritage.	N - Only single drilling operation at any one time	N - Control Measures in place to detect and prevent interactions	High for individual and cumulative impacts.	No cumulative impact cause-effect pathways identified for COPA activities based on a review of seabed disturbance (Section 6.3) which highlights the limited spatial and temporal nature of the aspects. No cumulative impact cause-effect pathways identified for COPA and other reasonably foreseeable activities with similar aspects. Impacts to maritime archaeological heritage are not predicted from seismic surveys. Drilling activities required to undertake seabed surveys prior to seabed disturbance. Impacts to maritime archaeological heritage are not a planned event and therefore cumulative impacts are not predicted.	None Identified

Aspect	Species /Receptor	Conservation Values e.g. EPBC Listed	Conservation Management Plan	Relevant Threatening Processes	Relevant spatial extent (e.g. BIA)	Any biologically important features (e.g. behaviours or critical life-cycle stages, timings)	Relevant Actions from Legislative or other Requirements	Acceptable Level	Baseline - Existing Environment (pressures and condition)	Regia	COP	Beach	Cooper	Woodside	Potential for Cumulative Impact	Control Measures	Description of Cumulative Impact	Assessment against baseline	Is the Acceptable Level Met	ALARP - Additional controls	ACTIONS
Interference via Displacement	The COP operational areas overlap 2 moderate fishing intensity data for: +SESS - Shark Gilnet Sector (SESS - CGS) - Sustainable stock with exception of School shark (Conservation Dependent - fishing pressure) +Southern Squid Ig Fishery and Commonwealth Trawl Sector squid catch (SSP) - Sustainable stock +Victorian SRL Fishery - Sustainable stock +Victorian GC Fishery - Sustainable stock	Socio-economic value to local communities and national economy	Southern and Eastern Scalefish and Shark Fishery (SESSF) Species Summaries (AFMA, 2023)	Nil, other than fishing pressure for school shark (Conservation Dependent - fishing pressure).	Fishery Management Areas for: +Southern and Eastern Scalefish and Shark Fishery - Gilnet Hook Trap Sector Shark Gilnet sub-sector (SESS - CGS) +Southern Squid Ig Fishery (SSP) +Shark Lander Fishery (SRL Vic) +Giant Crab Fishery (GC Vic)	+SESS - CGS: 12 months, starts 1 May +SSP: 12 months, actual fishing January-June (highest catch generally March, April) +SRL Vic: Closed for males 15Sept-15Nov and females 1Jun-15Nov +GC Vic: Closed for males 15Sept-15Nov and females 1Jun-15Nov	There are no relevant recovery plans and actions.	Commercial fishers are not economically disadvantaged as a result of oil and gas activities in the offshore Otway Basin.	Fisheries overlap with existing shipping channel and area with existing oil and gas activity. Fisheries with moderate activity in the area historically have sustainable stock status; however School sharks are listed as Conservation Dependent (fishing pressure) in the SESS - Shark Gilnet Sector.	SESS - CGS GC Vic SRL Vic	SESS - CGS GC Vic SRL Vic	SESS - CGS GC Vic SRL Vic	SESS - CGS SRL Vic	SESS - CGS SRL Vic	One seismic survey occurring concurrently with drilling/P&A activities and/or consecutive drilling/P&A activities with operational inclusions zones overlapping fishery management areas, in addition to existing pressures.	As per Otway Exploration Drilling Program EP - CM01: Marine and Coastal Users Consultation and Communication Plan and CM02: Commercial Marine Users Adjustment Protocol	Commercial fishers with moderate to high use for the term of the EP may potentially be displaced within offshore fishery Management Areas in the offshore Otway Basin by the proposed Otway Exploration Program and by other reasonably foreseeable future activities, requiring multiple applications for compensation to be lodged to a range of titleholders.	The cumulative impact of displacement from Otway petroleum activities would be low to moderate in comparison to the displacement associated with existing shipping operations within the fishery management areas. In addition, shipping vessels are not required to provide compensation.	Yes, as per Otway Exploration Drilling Program EP.	Titleholders overlapping fishery management areas with recorded fishing intensity typically have a compensation protocol in place to ensure fishers are no worse off as a result of their proposed activity.	CM04: Commercial Marine Users Adjustment Protocol 4.2 ConocoPhillips Australia will work with other titleholders, fishing associations and fishers, to design an application process for compensation that minimises the potential for cumulative impacts to commercial fishers.
Light	Short-tailed shearwaters (Redfings).	Not listed, but foraging and breeding BIA within flaring EMBA.	Wildlife Conservation Plan for Seabirds (DCEEW 2020) National Recovery Plan for Albatrosses and Petrels (DCEEW 2022a) National Light Pollution Guidelines for Wildlife (CoA 2023)	Reasons for inclusion in assessment: Light pollution, including from gas flaring, is listed as a threat to seabirds in the Wildlife Conservation Plan, with potential for consequences affecting individuals but not whole populations. The recommended management action is to implement measures to reduce the impact of light pollution near breeding colonies. Light pollution was identified as representing a potential threat to short-tailed shearwaters, predominantly Redfings, during consultation. The National Recovery Plan for Albatrosses and Petrels also states that light associated with coastal developments at or adjacent to breeding sites represents a moderate threat to short-tailed shearwater.	Foraging and breeding BIA within flaring EMBA and other breeding places noted in consultation.	Foraging September to May Breeding September-April Fledging period end of April to beginning of May	Wildlife Conservation Plan for Seabirds: Mitigate against impacts of light pollution around breeding colonies. National Light Pollution Guidelines for Wildlife recommend: 1. Always using Best Practice Lighting Design to reduce light pollution and minimise the effect on wildlife. 2. Undertaking an Environmental Impact Assessment for effects of artificial light on listed species for which artificial light has been demonstrated to affect behaviour, survivorship or reproduction.	Cumulative light does not impact short-tailed shearwaters as a population level.	Existing lighting in the area includes fishing vessels, shipping traffic, existing offshore oil and gas platform and coastal developments. The shipping channel for vessels coming from Melbourne to Tasmania is one of the busiest shipping routes in offshore Australia.	Y- Foraging and Breeding BIA. Breeding sites at Deen Maar (Lady Julia Percy Island), Middle Island and Griffiths Island.	Y- Foraging and Breeding BIA. Breeding sites at Deen Maar (Lady Julia Percy Island), Middle Island and Griffiths Island.	Y- Foraging BIA. Breeding sites at Deen Maar (Lady Julia Percy Island), Middle Island and Griffiths Island.	Y- Foraging BIA.	Y- Foraging BIA. Breeding sites at Deen Maar (Lady Julia Percy Island), Middle Island and Griffiths Island. Breeding BIA: no overlap predicted from multiple projects.	As per Otway Exploration Drilling Program EP - CM01: Marine Assurance Process CM02: Vessel and MDOU Operating Procedures CM07: Light Management Plan CM10: Well Testing Program CM11: Procurement Vetting Process	Regia and COPA unlikely to co-occur, with limited potential for impacts from consecutive operations which are scheduled to be years apart in this area. No cause-effect pathway for cumulative impact identified. In addition, CM10 (Well Testing Program) 10.5 states no flaring within VIC PPS-N during 2-week period of shearwater fledging, as advised by MRE 'as seabird specialists. No cause-effect pathway for cumulative impact identified. Foraging BIA: limited spatial extent of effect compared to area available for foraging. Most species forage during daylight.	As per Otway Exploration Drilling Program EP.	Yes, as per Otway Exploration Drilling Program EP.	Titleholders overlapping bird foraging or breeding BIA are required to have a light management plan that meets the requirements of the National Light Pollution Guidelines. Commitment to share information amongst Otway Basin Petroleum Titleholders on attractions and groundings of birds and opportunities for improvement to be able to ensure management of change can respond to operational experience.	CM07: Light Management Plan 7.7 ConocoPhillips Australia will work with other titleholders with the aim of minimising the potential for cumulative impacts associated with light emissions, should activity timings overlap biologically important periods for light sensitive species. 7.8 Report observation, incidents and opportunities for improvement regarding light management and bird interactions to other Otway Titleholders.1	
Light	Orange Bellied Parrot	Critically Endangered	National Recovery Plan for the Orange Bellied Parrot (Nepenthes) (DCEEW 2016)	Reason for inclusion in assessment: Light - illuminated boats and structures within the migration route as a barrier to migration.	Probable Migration Route, Migration Route	Migration Sept-Nov (Southward); Feb-mid-March (northward)	Assess the risk of barriers, being illuminated structures or boats, on the migration route. Manage threat if the risk rating warrants action. National Light Pollution Guidelines for Wildlife recommend: 1. Always using Best Practice Lighting Design to reduce light pollution and minimise the effect on wildlife. 2. Undertaking an Environmental Impact Assessment for effects of artificial light on listed species for which artificial light has been demonstrated to affect behaviour, survivorship or reproduction.	Light from cumulative sources does not affect the orange-bellied parrot as a population level.	OBP migratory route is within the shipping channel for vessels coming from Melbourne to Tasmania and this one of the busiest shipping routes in offshore Australia.	Y- Increased ambient light as a result of operational light and flaring light N- Activity does not represent illuminated structure or vessels within migration routes	Y- Increased ambient light as a result of operational light N- Activity does not represent illuminated structure or vessels within migration routes	Y- Increased ambient light as a result of operational light N- Activity does not represent illuminated structure or vessels within migration routes	Y- Increased ambient light as a result of operational light N- Activity does not represent illuminated structure or vessels within migration routes	Y- Increased ambient light as a result of operational light N- Activity does not represent illuminated structure or vessels within migration routes	Only overlap predicted with light EMBA, not illuminated structures or vessels. Spatial: Potential overlap between Regia seismic and single drilling operation, and sequential drilling/P&A activities with light EMBA overlapping the route - for one session (while seismic is occurring). Temporal: Consecutive drilling operations over an extended period of time may have light EMBA that overlap the migration routes.	As per Otway Exploration Drilling Program EP - CM07: Light Management Plan and CM10: Well Testing Program	For seismic, cumulative impacts from light emissions on the probable migration route would be of short duration only within the eastern side of the area at night, concurrently with a single drilling operation. Seismic program is limited to a maximum of 90 days, with 60 days of acquisition. Temporal: Light EMBA from a single drilling operation overlapping varying spatial extents of the probable migration route over a period of years. No evidence of OBP presence recorded during 18 month drilling campaign in region. OBP numbers continue to increase.	The cumulative impact of light emissions from Otway petroleum activities would be very low in comparison to the light emissions associated with existing shipping and fishing operations within the migration route. In addition, the majority of these vessels are not required to operate in accordance with a Light Management Plan.	The impact of light emissions from a seismic vessel overlapping the light emission from a drilling rig are predicted to result in increases in ambient light that are short term, fully recoverable and do not represent illuminated structures or boats within the migration route. Temporal: Light from drilling activities will only occur from single location, with limited overlap with the probable migration route and do not represent illuminated structures or boats within the migration route.	Most titleholders have committed to having a light management plan that meets the requirements of the National Light Pollution Guidelines. Commitment to share information amongst Otway Basin Petroleum Titleholders on attractions and groundings of birds and opportunities for improvement to be able to ensure management of change can respond to operational experience.	CM07: Light Management Plan 7.7 ConocoPhillips Australia will work with other titleholders with the aim of minimising the potential for cumulative impacts associated with light emissions, should activity timings overlap biologically important periods for light sensitive species. 7.8 Report observation, incidents and opportunities for improvement regarding light management and bird interactions to other Otway Titleholders.1
Light	Common diving petrel	Not listed, but conservation value in the south-east and temperate east.	National Recovery Plan for Albatrosses and Petrels (DCEEW 2022a) Wildlife Conservation Plan for Seabirds (DCEEW 2020) National Light Pollution Guidelines for Wildlife (CoA 2023)	Reasons for inclusion in assessment: Light emissions are identified as a threat in the National Recovery Plan for the Southern Right Whale (DCEEW, 2024a) identifying the SRW as a species of cultural significance.	A foraging BIA was identified within both the light and flaring EMBA A breeding BIA was identified within both the light and flaring EMBA Breeding area Deen Maar (Lady Julia Percy Island) overlapped by both the light and flaring EMBA.	Breeding: Variable but generally between April and December	National Recovery Plan for Albatrosses and Petrels: no relevant actions. Wildlife Conservation Plan for Seabirds: Mitigate against impacts of light pollution around breeding colonies. National Light Pollution Guidelines for Wildlife recommend: 1. Always using Best Practice Lighting Design to reduce light pollution and minimise the effect on wildlife. 2. Undertaking an Environmental Impact Assessment for effects of artificial light on listed species for which artificial light has been demonstrated to affect behaviour, survivorship or reproduction.	Cumulative light does not impact the common diving petrel as a population level.	Existing lighting in the area includes fishing vessels, shipping traffic, existing offshore oil and gas platform and coastal developments. The shipping channel for vessels coming from Melbourne to Tasmania is one of the busiest shipping routes in offshore Australia.	Y- Foraging BIA, Breeding BIA	Y- Foraging BIA, Breeding BIA	Y- Foraging BIA	Y- Foraging BIA	Y- Foraging BIA	Foraging BIA: Potential for overlap between single seismic survey and single drilling operation, and sequential drilling/P&A activities. Breeding BIA: This species is particularly susceptible to coastal light impacts when returning to or leaving the nesting colony which may result in a disruption to adult nest attendance (CoA 2023). Regia and COPA unlikely to co-occur, with limited potential for impacts from consecutive operations which are scheduled to be years apart in this area. No cause-effect pathway for cumulative impact identified.	As per Otway Exploration Drilling Program EP - CM01: Marine Assurance Process CM02: Vessel and MDOU Operating Procedures CM07: Light Management Plan CM10: Well Testing Program CM11: Procurement Vetting Process	Potential for cumulative impacts associated with: Foraging BIA: limited spatial extent of effect compared to area available for foraging. The National Recovery Plan states that marine infrastructure interactions, including those associated with artificial light, are classified as having no risk category priority and affecting 'Nf' species in Australian jurisdiction. Breeding BIA: limited spatial extent of effect compared to area available for foraging. The National Recovery Plan states that marine infrastructure interactions, including those associated with artificial light, are classified as having no risk category priority and affecting 'Nf' species in Australian jurisdiction. Breeding BIA: limited spatial extent of effect compared to area available for foraging. The National Recovery Plan states that marine infrastructure interactions, including those associated with artificial light, are classified as having no risk category priority and affecting 'Nf' species in Australian jurisdiction. Breeding BIA: limited spatial extent of effect compared to area available for foraging. The National Recovery Plan states that marine infrastructure interactions, including those associated with artificial light, are classified as having no risk category priority and affecting 'Nf' species in Australian jurisdiction. Breeding BIA: limited spatial extent of effect compared to area available for foraging. The National Recovery Plan states that marine infrastructure interactions, including those associated with artificial light, are classified as having no risk category priority and affecting 'Nf' species in Australian jurisdiction. Breeding BIA: limited spatial extent of effect compared to area available for foraging. The National Recovery Plan states that marine infrastructure interactions, including those associated with artificial light, are classified as having no risk category priority and affecting 'Nf' species in Australian jurisdiction.	As per Otway Exploration Drilling Program EP.	Yes, as per Otway Exploration Drilling Program EP.	Titleholders overlapping bird foraging or breeding BIA are required to have a light management plan that meets the requirements of the National Light Pollution Guidelines. Commitment to share information amongst Otway Basin Petroleum Titleholders on attractions and groundings of birds and opportunities for improvement to be able to ensure management of change can respond to operational experience.	CM07: Light Management Plan 7.7 ConocoPhillips Australia will work with other titleholders with the aim of minimising the potential for cumulative impacts associated with light emissions, should activity timings overlap biologically important periods for light sensitive species. 7.8 Report observation, incidents and opportunities for improvement regarding light management and bird interactions to other Otway Titleholders.1
Underwater Sound	Southern right whale (SRW)	Endangered.	National Recovery Plan for the Southern Right Whale (DCEEW, 2024a) identifies the SRW as a species of cultural significance.	Reason for inclusion in assessment: National Recovery Plan for the Southern Right Whale identifies noise interference as a threat.	Overlap of underwater sound EMBA with Migration BIA.	Migration: April - October Breeding: May - September	National Recovery Plan for the Southern Right Whale: Actions within and adjacent to SRW BIA and habitat critical to the survival of SRWs should demonstrate that it does not prevent any southern right whale from utilising the area or cause auditory impairment and that the risk of behavioural disturbance is minimised. NOTE: Legal definition of 'Should' means expected course of action or policy to be followed unless inappropriate for a particular circumstance. NOTE: No habitat critical to the survival of SRWs have been identified within the sound EMBA.	The activity will be carried out in a manner that will not be inconsistent with the National Recovery Plan for the Southern Right Whale (DCEEW 2024a) such that it does not prevent any southern right whale from utilising the area or cause auditory impairment and that the risk of behavioural disturbance is minimised.	BIAs overlap fisheries and shipping channel.	N- Reproduction BIA Y- Migration BIA	N- Reproduction BIA Y- Migration BIA	N- Reproduction BIA Y- Migration BIA	Unsure	Unsure	Cumulative impacts from COP activities to the SRW Reproduction BIA are not predicted as the COP sound EMBA do not overlap with this area. With the current uncertainty on the timing of some other projects and the distance of underwater sound EMBA, there is the potential for cumulative impact if the following occur within the migration BIA during the biologically relevant periods (monthly November to May): - Overlap between one seismic survey and one drilling activity for one session. - Consecutive drilling/P&A activities over a number of seasons.	As per Otway Exploration Drilling Program EP - CM01: Marine Assurance Process CM02: Vessel and MDOU Operating Procedures CM08: Whale Management Plan CM10: Drilling Program CM11: Procurement Vetting Process	Without appropriate detection and actions in place there is the potential that SRWs could be exposed to underwater sound from two sources (seismic and drilling) within the migration BIA that could result in them expending more energy to move away from the sound source when migrating to and from coastal breeding areas. This could also occur for consecutive years whilst drilling/P&A activities are undertaken within the Otway Basin. Cumulative impacts resulting in an increase in the likelihood of PTS and TTS for a migrating SRW is not predicted due to the small distances to the PTS and TTS noise criteria for drilling activities.	As per Otway Exploration Drilling Program EP.	Titleholders are required to undertake their activity in a manner that is not inconsistent with the in force Conservation Management Plan for Southern Right Whale.	Titleholders undertaking petroleum activities in the Otway Basin are required to undertake their activity in a manner that is not inconsistent with the in force Conservation Management Plan for Southern Right Whale. Commitment to share information amongst Otway Basin Petroleum Titleholders on whales, detection methodologies and opportunities for improvement to be able to ensure management of change can respond to operational experience.	CM08: Whale Management Plan EP5.1 ConocoPhillips Australia will develop and implement a Fauna Management Plan (FMP) for the activity. This Plan will be in place 30 days prior to the commencement of activities within the Operational Area. ConocoPhillips Australia will work with other Otway Basin Petroleum Titleholders with the aim of minimising the potential for cumulative impacts associated with underwater sound, should activity timings overlap biologically important periods for fin or sei whales. Observation, incidents, and opportunities for improvement will be reported to other petroleum titleholders in the Otway Basin regarding underwater sound management and whale interactions.
Underwater Sound	Blue whale (BW)	Endangered	Conservation Management Plan for the Blue Whale (DoE 2015) Guidance on key terms within the Blue Whale Conservation Management Plan (DAWE 2022a)	Reason for inclusion in assessment: Conservation Management Plan for the Blue Whale identifies anthropogenic noise interference as a threat.	Overlap of underwater sound EMBA with Foraging BIA.	November to May	Conservation Management Plan for the Blue Whale states that anthropogenic noise in BIAs must be managed so that blue whales can continue to utilise the area without injury and [are] not displaced from a foraging area. DAWE (2022a) details that underwater anthropogenic noise should not: - Stop or prevent any blue whale from foraging - Cause any blue whale to move on when foraging, or - Stop or prevent any blue whale from entering a foraging area	The activity will be carried out in a manner that will not be inconsistent with the Conservation Management Plan for the Blue Whale such that blue whales can continue to utilise the area without injury and [are] not displaced from a foraging area.	BIAs overlap fisheries and shipping channel.	Y- Foraging BIA	Y- Foraging BIA	Y- Foraging BIA	Y- Foraging BIA	Y- Foraging BIA	With the current uncertainty on the timing of some other projects and the distance of underwater sound EMBA, there is the potential for cumulative impact if the following occur within the migration BIA during the biologically relevant periods (monthly November to May): - Overlap between one seismic survey and one drilling activity for one session. - Consecutive drilling/P&A activities over a number of seasons.	As per Otway Exploration Drilling Program EP - CM01: Marine Assurance Process CM02: Vessel and MDOU Operating Procedures CM08: Whale Management Plan CM10: Drilling Program CM11: Procurement Vetting Process	Without appropriate detection and actions in place there is the potential that blue whales could be exposed to underwater sound from two sources (seismic and drilling) within the migration BIA that could result in them expending more energy to move away from the sound source when migrating through of foraging in the area. This could also occur for consecutive years whilst drilling/P&A activities are undertaken within the Otway Basin. Cumulative impacts resulting in an increase in the likelihood of PTS and TTS for a migrating blue whale is not predicted due to the small distances to the PTS and TTS noise criteria for drilling activities.	As per Otway Exploration Drilling Program EP.	Titleholders are required to undertake their activity in a manner that is not inconsistent with the in force Conservation Management Plan for the Blue Whale.	Titleholders undertaking petroleum activities in the Otway Basin are required to undertake their activity in a manner that is not inconsistent with the in force Conservation Management Plan for the Blue Whale. Commitment to share information amongst Otway Basin Petroleum Titleholders on whales, detection methodologies and opportunities for improvement to be able to ensure management of change can respond to operational experience.	CM08: Whale Management Plan EP5.1 ConocoPhillips Australia will develop and implement a Fauna Management Plan (FMP) for the activity. This Plan will be in place 30 days prior to the commencement of activities within the Operational Area. ConocoPhillips Australia will work with other Otway Basin Petroleum Titleholders with the aim of minimising the potential for cumulative impacts associated with underwater sound, should activity timings overlap biologically important periods for fin or sei whales. Observation, incidents, and opportunities for improvement will be reported to other petroleum titleholders in the Otway Basin regarding underwater sound management and whale interactions.
Underwater Sound	Other underwater sound sensitive receptors undertaking biologically important behaviours - fin whale (FW), sei whale (SW), pygmy right whale (PRW)	FW - vulnerable SW - vulnerable PRW - no listing	Conservation advice Baleenoptera physalus (fin whale) (TSSC 2015d) Conservation advice Baleenoptera borealis (sei whale) (TSSC 2015c) Conservation advice Baleenoptera borealis (pygmy right whale) (TSSC 2015c)	Reason for inclusion in assessment: These species may be undertaking biologically important behaviours in the area. Conservation advice Baleenoptera physalus (fin whale) identifies anthropogenic noise and acoustic disturbance as a minor threat. Conservation advice Baleenoptera borealis (sei whale) identifies anthropogenic noise and acoustic disturbance as a minor threat. Foraging, feeding or related behaviour may occur within area for the PRW. Distribution is expected to be throughout the Boreney Coast Upwelling KEF and adjacent waters based on where kill aggregations occur.	No BIA or habitat critical to the survival of any species were identified within the behavioural noise EMBA. Presence within behavioural noise EMBA for FW and SW listed as foraging likely and known to occur, with PRW listed as foraging may and likely to occur.	FW - migrations from higher latitude summer feeding grounds to lower latitude winter breeding grounds SW - seasonal migrations from subpolar summer feeding grounds to lower latitude winter breeding grounds PRW - primarily recorded in areas associated with upwellings and with high zooplankton abundance, Boreney Coast Upwelling known to occur from November to April with peaks from January to March.	Conservation advice Baleenoptera physalus (fin whale) identifies anthropogenic noise and acoustic disturbance as a minor threat. Conservation advice Baleenoptera borealis (sei whale) identifies anthropogenic noise and acoustic disturbance as a minor threat. SEI, FW and PRWs can continue to utilise the area, with the risk of injury and disturbance minimised.	Existing underwater sound in the area includes fishing vessels and shipping traffic. The shipping channel for vessels coming from Melbourne to Tasmania is one of the busiest shipping routes in offshore Australia.	Y - no identified BIA but presence listed as foraging known or likely to occur	Y - no identified BIA but presence listed as foraging likely to occur	Y - no identified BIA but presence listed as foraging likely to occur	Y - no identified BIA but presence listed as foraging likely to occur	Y - no identified BIA but presence listed as foraging likely to occur	Y - no identified BIA but presence listed as foraging likely to occur	With the current uncertainty on the timing of some other projects and the distance of underwater sound EMBA, there is the potential for cumulative impact if the following occur within the biologically relevant periods: - Overlap between one seismic survey and one drilling activity for one session. - Consecutive drilling/P&A activities over a number of seasons.	As per Otway Exploration Drilling Program EP - CM01: Marine Assurance Process CM02: Vessel and MDOU Operating Procedures CM08: Whale Management Plan CM10: Drilling Program CM11: Procurement Vetting Process	Without appropriate detection and actions in place there is the potential that blue whales could be exposed to underwater sound from two sources (seismic and drilling) within the migration BIA that could result in them expending more energy to move away from the sound source when migrating through of foraging in the area. This could also occur for consecutive years whilst drilling/P&A activities are undertaken within the Otway Basin. Cumulative impacts resulting in an increase in the likelihood of PTS and TTS for a migrating blue whale is not predicted due to the small distances to the PTS and TTS noise criteria for drilling activities. In addition, no BIA or habitat critical to the survival of the fin, sei or pygmy right whales were identified within the behavioural noise EMBA.	As per Otway Exploration Drilling Program EP.	Titleholders undertake activities in a manner that is not inconsistent with the in force Conservation Advice for the fin and sei whales	Titleholders undertake activities in a manner that is not inconsistent with Conservation Advice for each species. Commitment to share information amongst Otway Basin Petroleum Titleholders on whales, detection methodologies and opportunities for improvement to be able to ensure management of change can respond to operational experience.	CM08: Whale Management Plan EP5.1 ConocoPhillips Australia will develop and implement a Fauna Management Plan (FMP) for the activity. This Plan will be in place 30 days prior to the commencement of activities within the Operational Area. ConocoPhillips Australia will work with other Otway Basin Petroleum Titleholders with the aim of minimising the potential for cumulative impacts associated with underwater sound, should activity timings overlap biologically important periods for fin or sei whales. Observation, incidents, and opportunities for improvement will be reported to other petroleum titleholders in the Otway Basin regarding underwater sound management and whale interactions.

Variables	Revision 1 – August 2023 (Always required at least one well in each permit)				Revision 2 – June 2024				Change in Scope (-ve = reduction from June 2024)			Worst-Case Scenarios for Assessment
	Total (Units)	Worst-case VIC/P79-Nth	Worst-case VIC/P79-Sth	Worst-case VIC/P79-Nth	Total	Worst-case VIC/P79-Nth	Worst-case VIC/P79-Sth	Worst-case T/49P	Worst-case VIC/P79-Nth	Worst-case VIC/P79-Sth	Worst-case T/49P	
CHANGE BY ACTIVITY SCOPE												
Seabed surveys	9 survey locations (#)	8	8	8	9	3	5	2	-5	-3	-6	NOTE: One seabed survey will not be conducted within one area TBD (9 in total)
									-63%	-38%	-75%	
Wells	6 wells (#)	5	5	5	6	2	4	1	-3	-1	-4	NOTE: One well will not be drilled within one area TBD (6 in total)
									-60%	-20%	-80%	
VSP	6 VSPs (#)	5	5	5	2	1	0	1	-4	-5	-4	Worst-case locations: - Vic/P79-Nth closest point to Deen Maar/ Bonney KEF (high productivity area) – light and underwater sound, and hydrocarbon release. - T/49P closest Point to penguin BIA/fur-seal haul-outs.
									-80%	-100%	-80%	
DST (Flaring)	6 DSTs (#)	5	5	5	4	1	2	1	-4	-3	-4	Worst-case locations: - Vic/P79-Nth closest point to Deen Maar/ Bonney KEF - T/49P closest Point to OBP Migration; Shearwater breeding; King Island (community – visibility)
									-80%	-60%	-80%	
CHANGE BY AREA												
Total Change (km ²)	(km ²)	4505.1			-	3271.4			-1233.7			Worst-case combinations: - VIC-Nth: 2 wells close to Deen Maar - VIC-Sth: 4 wells all together - Consider effects of AL: No more than 3 wells drilled within any 12 month period in VIC
Change in each (km ²)	(km ²)	1262.9	1068.1	2174.1	-	1169	970.4	1132	-93.9	-97.7	-1042.1	
									-7%	-9%	-48%	
CHANGE BY DURATION												
Seabed Surveys	7 days per location (days)	56	56	56	-	21	35	14	-35	-21	-42	Worst-case combinations: - 9 seabed surveys over 9 weeks in collocated areas within each permit - 3 wells drilled next to each other within any 12 month period in VIC/P79-Sth
									-63%	-38%	-75%	
Drilling	30-90 days per location (days)	150-450	150-450	150-450	-	60-180	120-360	30-90	-270	-90	-360	
									-60%	-20%	-80%	
VSP	20 hours per well (h)	100	100	100	12 hours per well	20	0	20	-80	-100	-80	
									-80%	-100%	-80%	
DST	120 hours per well (h)	600	600	600	100 hours per well	100	200	100	-500	-400	-500	
									-83%	-67%	-83%	
CHANGE BY ASPECT												
Interferences with other marine and coastal users- Displacement												
Safe Navigation Area	6x6 km ² + 500m buffer = 42.25 km ² each (km ²)	211.25	211.25	211.25	-	84.5	169	42.25	-126.75	-42.25	-169	Worst-case combinations: - 9 seabed surveys over 9 weeks across three areas - 3 wells drilled within any 12 month period in VIC/P79-South
									-60%	-20%	-80%	
PSZ +Cautionary Zone	2 km radius = 12.6 km ² each (km ²)	63	63	63	-	25.2	50.4	12.6	-37.8	-12.6	-50.4	
									-60%	-20%	-80%	
Seabed Disturbance												
Total Area (km ²)	Initial proposal for 9 seabed survey locations with USBLs and 12 grab samples, and 6 wells with area for IWCD tethers, and without USBLs, etc	0.0367			9 seabed surveys + USBLs + 36 grabs/ cores, 6 wells with USBLs, 4 wells with tethers.	0.0364			-0.0003			Worst-case combinations for seabed disturbance: - 4 wells in VIC-P-Sth - 3 wells drilled within any 12 month period in VIC/P79-Sth (within GC block) NOTE: In event that 6 seabed surveys are conducted in VIC/P79-South, one survey would not be conducted in one of the other two operational areas - ensuing only 9 seabed surveys are conducted in total. In event that 4 wells are drilled within VIC/P79-South, one well would not be drilled in one of the the other two operational areas - ensuing only 6 wells
Per OA		0.0305	0.0305	0.0305		3 seabed surveys and 2 wells	5 seabed surveys and 4 wells	2 seabed surveys and 1 well	3 seabed surveys and 2 wells	5 seabed surveys and 4 wells	2 seabed surveys and 1 well	
						0.012	0.024	0.006	-0.0185	-0.0065	-0.0245	
									-61%	-21%	-80%	
Light Emissions												
Routine light – survey	20 km around survey vessel (km ²)	10053.10	10053.10	10053.10	-	3769.91	6283.19	1256.64	-6283.185307	-3769.911184	-8796.45943	Worst-case locations: VIC/P-Nth 2 wells at closest points to Deen Maar T/49P 1 well closest point to OBP Migration or King Island (community)
									-63%	-38%	-88%	
Routine light – rig	20 km around rig (km ²)	6283.19	6283.19	6283.19	-	2513.27	5026.55	1256.64	-3769.92	-1256.64	-5026.55	
									-60%	-20%	-80%	
Duration of light – survey vessel	7 days per location (days)	56	56	56	-	21	35	14	-35	-21	-42	
									-63%	-38%	-75%	
Duration of light - rig	90 days per well (days)	450	450	450	-	180	360	90	-270	-90	-360	
									-60%	-20%	-80%	
Flaring	50 km radius around flare (km ²)	39269.91	39269.91	39269.91	-	7853.98	15707.96	7853.98	-31415.93	-23561.95	-31415.93	
									-80%	-60%	-80%	
Duration of flaring	120 hours per well	600	600	600	100 hours per well	100	200	100	-500	-400	-500	
									-83%	-67%	-83%	
Atmospheric Emissions												
Assumed max case	6 wells + 6 DSTs (kT CO ₂ e)	247			6 wells and 4 DSTs	135			-112			Worst-case locations: - Emissions closest to coastal locations, depending on prevailing winds (but not expected to reach coast)
Assumed min credible	6 wells + 2 DSTs (kT CO ₂ e)	106							-45%			
									29			
									27%			
Underwater Sound Emissions – Non-Impulsive												
Survey Duration	7 days per location (days)	56	56	56	-	21	35	14	-35	-21	-42	Worst-case locations: - Vic/P79-Nth closest point to Deen Maar/ Bonney KEF (high productivity area) - T/49P closest Point to penguin BIA/fur-seal haul-outs. NOTE: Assumes all wells could be drilled in water depths < 125 m.
									-63%	-38%	-75%	
Survey Area – Vessel Operations	Largest effect distance 2.73 km for TTS(470m)	187.31	187.31	187.31	-	70.24	117.07	46.83	-117	-70	-140	
									-63%	-38%	-75%	
Drilling Duration	90 days per location (days)	450	450	450	-	180	360	90	-270	-90	-360	
									-60%	-20%	-80%	
Drilling Area – 12.6 km	Greatest on-shelf effect distance	2493.80	2493.80	2493.80	-	997.52	1995.04	498.76	-1496	-499	-1995	
									-60%	-20%	-80%	
Drilling Area – 22.8 km	Greatest shelf-edge effect distance	8165.63	8165.63	8165.63	-	1633.13	1633.13	1633.13	-6533	-6533	-6533	
									-80%	-80%	-80%	
Underwater Sound Emissions – Impulsive												
SBP Duration	7 days per location (days)	56	56	56	-	21	35	14	-35	-21	-42	Worst-case locations: - Vic/P79-Nth closest point to Deen Maar/ Bonney KEF (high productivity area) - T/49P closest Point to penguin BIA/fur-seal haul-outs.
									-63%	-38%	-75%	
SBP Area - SRW 500 m	Greatest effect distance of 130 m for 20 hours per well	6.28	6.28	6.28	-	2.36	3.93	1.57	-3.93	-2.36	-4.71	
									-63%	-38%	-75%	
VSP Duration	20 hours per well (hours)	100	100	100	12 hours per well	12	0	12	-88.00	-100.00	-88.00	
									-88%	-100%	-88%	
VSP Area –BW 1.5 km	Greatest effect distance (km ²)	35.34	35.34	35.34	-	7.07	0.00	7.07	-28.27	-35.34	-28.27	
									-80%	-100%	-80%	
VSP Area –SRW 6.4 km	Greatest effect distance (km ²)	643.40	643.4	643.4	-	128.68	0.00	128.68	-514.72	-643.40	-514.72	
									-80%	-100%	-80%	
Planned Drilling Discharges												
Drill fluid/cuttings	To sea 2300m ³ per well (m ³)	11500	11500	11500	-	4600	9200	2300	-6900	-2300	-9200	
									-60%	-20%	-80%	
Drill fluid/cuttings	To seabed 2170m ³ per well (m ³)	10850	10850	10850	-	4340	8680	2170	-6510	-2170	-8680	
									-60%	-20%	-80%	

BOP fluid	2200L per well (L)	11000	11000	11000	-	4400	8800	2200	-6600	-2200	-8800	
									-60%	-20%	-80%	
Cement	30m ³ per well (m ³)	150	150	150	-	60	120	30	-90	-30	-120	
									-60%	-20%	-80%	
Testing/ Spoils /Discharges	40m ³ per well (m ³)	200	200	200	-	80	160	40	-120	-40	-160	
									-60%	-20%	-80%	
Planned Operational Discharges												
Putrescible Waste	Seabed Survey (80L/day)	4480	4480	4480	-	1680	2800	1120	-2800	-1680	-3360	
									-63%	-38%	-75%	
Putrescible Waste	Drilling (520L/day)	234000	234000	234000	-	93600	187200	46800	-140400	-46800	-187200	
									-60%	-20%	-80%	
Treated Sewage/Grey	Seabed Survey (17.5m ³ /day)	980	980	980	-	367.5	612.5	245	-612.5	-367.5	-735	
									-63%	-38%	-75%	
Treated Sewage/Grey	Drilling (112.7m ³ /day)	50715	50715	50715	-	20286	40572	10143	-30429	-10143	-40572	
									-60%	-20%	-80%	
Treated oily water	80L/day Combined	36000	36000	36000	-	14400	28800	7200	-21600	-7200	-28800	
									-60%	-20%	-80%	
RO Brine	170L/day Combined	76500	76500	76500	-	30600	61200	15300	-45900	-15300	-61200	
									-60%	-20%	-80%	
Cooling Water	4800 m ³ /day Combined	2160000	2160000	2160000	-	864000	1728000	432000	-1296000	-432000	-1728000	
									-60%	-20%	-80%	
Loss of Material or Waste Overboard, Minor Loss of Containment, Interactions with Marine Fauna, Invasive Marine Species, Accidental Release of Hydrocarbons (MDO/LOWC) - Based on activity durations and area within which this could occur												
Total Change (km ²)	Total for operational areas (km ²)	4505.1			-	3271.4			-1233.7			
									-27%			
Change in each (km ²)	(km ²)	1262.9	1068.1	2174.1	-	1169	970.4	1132	-93.9	-97.7	-1042.1	
									-7%	-9%	-48%	
Seabed Surveys	7 days per location (days)	56	56	56	-	21	35	14	-35	-21	-42	
									-63%	-38%	-75%	
Drilling	30-90 days per location (days)	150-450	150-450	150-450	-	60-180	120-360	30-90	-270	-90	-360	
									-60%	-20%	-80%	

Worst-case combinations:

- 3 wells drilled next to each other within any 12 month period in VIC/P79-Sth
- Then 4th well drilled in this area.

NOTE: Update discharges for cement following EP update for Minamata Convention

Worst-case combinations:

- VIC-Nth: 2 wells close to Deen Maar
- VIC-Sth: 4 wells all together
- Consider effects of AL: No more than 3 wells drilled within any 12 month period in VIC-Sth

APPENDIX B EPBC PMST REPORTS



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P Operational Area

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	14
Key Ecological Features (Marine):	1
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardeanna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardeanna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area

Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Apollo	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action Otway Development	2002/621	Controlled Action	Post-Approval
Not controlled action INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner) 2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval

Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
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Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas	[Resource Information]	
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Scientific Name	Behaviour	Presence
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Seabirds		
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Ardenna pacifica		
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Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
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Ardenna tenuirostris		
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Short-tailed Shearwater [82652]	Foraging	Known to occur
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Diomedea exulans (sensu lato)		
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Wandering Albatross [1073]	Foraging	Known to occur
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Diomedea exulans antipodensis		
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Antipodean Albatross [82269]	Foraging	Known to occur
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Pelagodroma marina		
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White-faced Storm-petrel [1016]	Foraging	Known to occur
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Pelecanoides urinatrix		
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Common Diving-petrel [1018]	Foraging	Known to occur
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Thalassarche bulleri		
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Bullers Albatross [64460]	Foraging	Known to occur
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Thalassarche cauta cauta		
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Shy Albatross [82345]	Foraging likely	Likely to occur
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Thalassarche chlororhynchos bassi		
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Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
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Thalassarche melanophris		
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Black-browed Albatross [66472]	Foraging	Known to occur
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Thalassarche melanophris impavida		
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Campbell Albatross [82449]	Foraging	Known to occur
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Sharks		
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Carcharodon carcharias		
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White Shark [64470]	Distribution	Known to occur
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Scientific Name	Behaviour	Presence
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[Carcharodon carcharias](#)

White Shark [64470]

Distribution

Likely to occur

[Carcharodon carcharias](#)

White Shark [64470]

Distribution
(low density)

Likely to occur

[Carcharodon carcharias](#)

White Shark [64470]

Known
distribution

Known to occur

Whales

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Distribution

Known to occur

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Foraging

Likely to be
present

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Foraging
(annual high
use area)

Known to occur

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Known
Foraging Area

Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P 2 km Sound EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	14
Key Ecological Features (Marine):	1
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardeanna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardeanna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
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Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area

Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed	
Controlled action Otway Development	2002/621	Controlled Action	Post-Approval	
Not controlled action INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	
Not controlled action (particular manner) 2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval	

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
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Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas	[Resource Information]	
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Scientific Name	Behaviour	Presence
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Seabirds		
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Ardena pacifica		
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Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
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Ardena tenuirostris		
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Short-tailed Shearwater [82652]	Foraging	Known to occur
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Diomedea exulans (sensu lato)		
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Wandering Albatross [1073]	Foraging	Known to occur
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Diomedea exulans antipodensis		
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Antipodean Albatross [82269]	Foraging	Known to occur
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Pelagodroma marina		
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White-faced Storm-petrel [1016]	Foraging	Known to occur
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Pelecanoides urinatrix		
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Common Diving-petrel [1018]	Foraging	Known to occur
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Thalassarche bulleri		
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Bullers Albatross [64460]	Foraging	Known to occur
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Thalassarche cauta cauta		
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Shy Albatross [82345]	Foraging likely	Likely to occur
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Thalassarche chlororhynchos bassi		
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Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
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Thalassarche melanophris		
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Black-browed Albatross [66472]	Foraging	Known to occur
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Thalassarche melanophris impavida		
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Campbell Albatross [82449]	Foraging	Known to occur
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Sharks		
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Carcharodon carcharias		
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White Shark [64470]	Distribution	Likely to occur
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Carcharodon carcharias		
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White Shark [64470]	Distribution	Known to occur
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Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P 3.59 km Sound EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	14
Key Ecological Features (Marine):	1
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardeanna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardeanna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area

Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Apollo	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action Otway Development	2002/621	Controlled Action	Post-Approval
Not controlled action INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner) 2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
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Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas	[Resource Information]	
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Scientific Name	Behaviour	Presence
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Seabirds		
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Ardenna pacifica		
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Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
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Ardenna tenuirostris		
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Short-tailed Shearwater [82652]	Foraging	Known to occur
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Diomedea exulans (sensu lato)		
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Wandering Albatross [1073]	Foraging	Known to occur
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Diomedea exulans antipodensis		
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Antipodean Albatross [82269]	Foraging	Known to occur
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Pelagodroma marina		
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White-faced Storm-petrel [1016]	Foraging	Known to occur
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Pelecanoides urinatrix		
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Common Diving-petrel [1018]	Foraging	Known to occur
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Thalassarche bulleri		
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Bullers Albatross [64460]	Foraging	Known to occur
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Thalassarche cauta cauta		
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Shy Albatross [82345]	Foraging likely	Likely to occur
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Thalassarche chlororhynchos bassi		
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Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
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Thalassarche melanophris		
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Black-browed Albatross [66472]	Foraging	Known to occur
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Thalassarche melanophris impavida		
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Campbell Albatross [82449]	Foraging	Known to occur
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Sharks		
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Carcharodon carcharias		
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White Shark [64470]	Distribution	Known to occur
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Scientific Name	Behaviour	Presence
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[Carcharodon carcharias](#)

White Shark [64470]

Distribution

Likely to occur

[Carcharodon carcharias](#)

White Shark [64470]

Distribution
(low density)

Likely to occur

[Carcharodon carcharias](#)

White Shark [64470]

Known
distribution

Known to occur

Whales

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Distribution

Known to occur

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Foraging

Likely to be
present

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Foraging
(annual high
use area)

Known to occur

[Balaenoptera musculus brevicauda](#)

Pygmy Blue Whale [81317]

Known
Foraging Area

Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P 12.6 km Sound EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	21
Key Ecological Features (Marine):	1
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardenna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardeanna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardeanna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area

Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed	
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed	
Controlled action				
Otway Development	2002/621	Controlled Action	Post-Approval	

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda		
Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

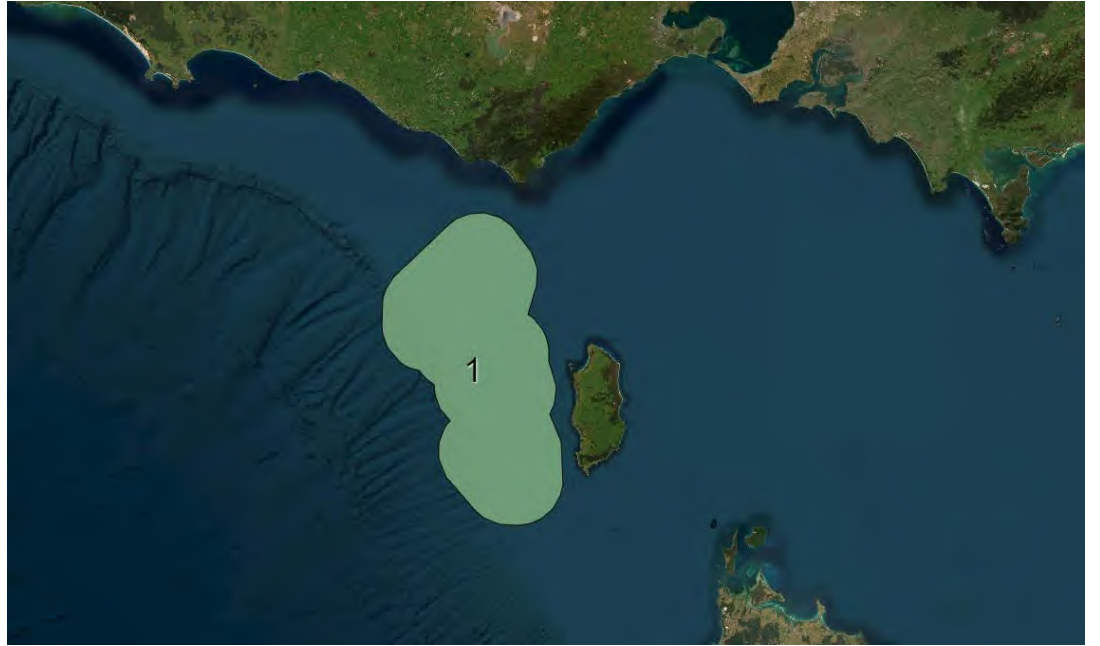
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P 22.8 km Sound EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	40

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	64
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	24
Key Ecological Features (Marine):	1
Biologically Important Areas:	23
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		

Current Scientific Name	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Marine Route Survey for Subsea Fibre Optic Data Cable System -	2024/09795		Completed	

Title of referral	Reference	Referral Outcome	Assessment Status
Australia East			
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Otway Development	2002/621	Controlled Action	Post-Approval
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas	[Resource Information]	
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Scientific Name	Behaviour	Presence
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Seabirds		
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Ardena pacifica		
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Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
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Ardena tenuirostris		
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Short-tailed Shearwater [82652]	Foraging	Known to occur
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Diomedea exulans (sensu lato)		
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Wandering Albatross [1073]	Foraging	Known to occur
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Diomedea exulans antipodensis		
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Antipodean Albatross [82269]	Foraging	Known to occur
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Eudyptula minor		
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Little Penguin [1085]	Foraging	Known to occur
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Morus serrator		
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Australasian Gannet [1020]	Foraging	Known to occur
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Pelagodroma marina		
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White-faced Storm-petrel [1016]	Foraging	Known to occur
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Pelecanoides urinatrix		
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Common Diving-petrel [1018]	Foraging	Known to occur
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Phalacrocorax fuscescens		
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Black-faced Cormorant [59660]	Foraging	Known to occur
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Thalassarche bulleri		
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Bullers Albatross [64460]	Foraging	Known to occur
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Thalassarche cauta cauta		
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Shy Albatross [82345]	Foraging likely	Likely to occur
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Thalassarche chlororhynchos bassi		
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Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
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Thalassarche melanophris		
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Black-browed Albatross [66472]	Foraging	Known to occur
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Scientific Name	Behaviour	Presence
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P 20 km light EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	23
Key Ecological Features (Marine):	1
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardeanna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardeanna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area

Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed	
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed	
Controlled action				
Otway Development	2002/621	Controlled Action	Post-Approval	

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Distribution	Known to occur

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 12-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P 49 km Flaring EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	89
Listed Migratory Species:	58

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	6
Commonwealth Heritage Places:	1
Listed Marine Species:	92
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	4
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	47
Regional Forest Agreements:	2
Nationally Important Wetlands:	8
EPBC Act Referrals:	39
Key Ecological Features (Marine):	1
Biologically Important Areas:	26
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Lavinia	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community may occur within area

Listed Threatened Species [[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
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BIRD

Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
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Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
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Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
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Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Species or species habitat may occur within area
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Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
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Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
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Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
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Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
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Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
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Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
FROG		
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Roosting known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
PLANT		
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat likely to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Unknown	
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60111]	TAS
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21583]	VIC

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic		
Cape Wickham Lighthouse	TAS	Listed place

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Franklin	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Badger Box Creek	Nature Reserve	TAS
Cape Wickham	State Reserve	TAS
Cape Wickham	Conservation Area	TAS
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
City of Melbourne Bay	Conservation Area	TAS
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Counsel Hill	Conservation Area	TAS
Currie Lightkeepers Residence	Historic Site	TAS
Deep Lagoons	Conservation Area	TAS
Disappointment Bay	State Reserve	TAS
Gentle Annie	Conservation Area	TAS
Great Otway	National Park	VIC
Kentford Forest	Nature Reserve	TAS
Kentford Forest	Conservation Area	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Lavinia	State Reserve	TAS
Lily Lagoon	Nature Reserve	TAS
Lymwood	Conservation Covenant	TAS
Muddy Lagoon	Nature Reserve	TAS
New Year Island	Game Reserve	TAS

Protected Area Name	Reserve Type	State
Parker River	Reference Area	VIC
Pegarah Forest	Conservation Covenant	TAS
Porky Beach	Conservation Area	TAS
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Sartoris Rd Nugara	Conservation Covenant	TAS
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Rocks	State Reserve	TAS
Seal Rocks	Conservation Area	TAS
South Rd Nugara	Conservation Covenant	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Tambar	Conservation Covenant	TAS
Tathams Lagoon	Conservation Area	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Twelve Apostles	Marine National Park	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Yambacoona	Conservation Covenant	TAS

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
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RFA Name	State
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Bungaree Lagoon	TAS
Lake Flannigan	TAS
Lower Aire River Wetlands	VIC
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Otway Development	2002/621	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P MDO Moderate EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	90
Listed Migratory Species:	59

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	7
Commonwealth Heritage Places:	1
Listed Marine Species:	98
Whales and Other Cetaceans:	29
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	5
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	37
Regional Forest Agreements:	2
Nationally Important Wetlands:	8
EPBC Act Referrals:	52
Key Ecological Features (Marine):	1
Biologically Important Areas:	29
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Lavinia	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community may occur within area

Listed Threatened Species [[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
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BIRD

Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
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Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
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Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
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Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Species or species habitat likely to occur within area
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Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
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Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
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Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
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Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
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Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
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Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area

FROG

Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area
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MAMMAL

Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Roosting known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

PLANT

Scientific Name	Threatened Category	Presence Text
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider- orchid [5505]	Vulnerable	Species or species habitat may occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Unknown	
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60111]	TAS
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21583]	VIC

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic		
Cape Wickham Lighthouse	TAS	Listed place

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Bird		

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding likely to occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Ziphius cavirostris		
Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats [\[Resource Information \]](#)

Name	Type of Presence
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Apollo	Multiple Use Zone (IUCN VI)
Boags	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Albatross Island	Nature Reserve	TAS
Badger Box Creek	Nature Reserve	TAS
Barham Paradise S.R.	Natural Features Reserve	VIC
Black Pyramid Rock	Nature Reserve	TAS
Cape Wickham	State Reserve	TAS
Cape Wickham	Conservation Area	TAS
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
City of Melbourne Bay	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Currie Lightkeepers Residence	Historic Site	TAS
Disappointment Bay	State Reserve	TAS
Gentle Annie	Conservation Area	TAS
Great Otway	National Park	VIC
Lavinia	State Reserve	TAS
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Muddy Lagoon	Nature Reserve	TAS
New Year Island	Game Reserve	TAS
Parker River	Reference Area	VIC
Porky Beach	Conservation Area	TAS
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Seal Rocks	State Reserve	TAS
Seal Rocks	Conservation Area	TAS
South Rd Nugara	Conservation Covenant	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Unnamed P0176	Private Nature Reserve	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
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Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
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Tasmania RFA	Tasmania
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West Victoria RFA	Victoria
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Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
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Aire River	VIC
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Bungaree Lagoon	TAS
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Lake Flannigan	TAS
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Lower Aire River Wetlands	VIC
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Pearshape Lagoon 1	TAS
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Pearshape Lagoon 2	TAS
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Pearshape Lagoon 3	TAS
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Pearshape Lagoon 4	TAS
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EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
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Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
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Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
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Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
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Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
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Controlled action

Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
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Otway Development	2002/621	Controlled Action	Post-Approval
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Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
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Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision			
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur

Scientific Name	Behaviour	Presence
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P MOD Low EBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	5
Wetlands of International Importance (Ramsar)	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	3
Listed Threatened Ecological Communities:	14
Listed Threatened Species:	180
Listed Migratory Species:	81

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	72
Commonwealth Heritage Places:	8
Listed Marine Species:	132
Whales and Other Cetaceans:	32
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	8
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	203
Regional Forest Agreements:	4
Nationally Important Wetlands:	23
EPBC Act Referrals:	272
Key Ecological Features (Marine):	4
Biologically Important Areas:	41
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status
Tasmanian Wilderness	TAS	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Natural

Tasmanian Wilderness	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Glenelg estuary and discovery bay wetlands	Within 10km of Ramsar site
Lavinia	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities

[[Resource Information](#)]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community may occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (<i>Eucalyptus ovata</i> / <i>E. brookeriana</i>)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (<i>Eucalyptus viminalis</i>) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

CRUSTACEAN

Scientific Name	Threatened Category	Presence Text
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat likely to occur within area
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat may occur within area
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
FISH		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thymichthys politus Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat may occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Oreisplanus munionga larana Marrawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat likely to occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area

Scientific Name	Threatened Category	Presence Text
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat may occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
OTHER		
Megascolides australis Giant Gippsland Earthworm [64420]	Vulnerable	Species or species habitat may occur within area
PLANT		
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Astrotricha sp. Wigan Inlet (J.A.Jeanes 2268) Wigan Star-hair [85675]	Endangered	Species or species habitat may occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider- orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat likely to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat may occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area
Centrolepis pedderensis Pedder Centrolepis, Pedder Bristlewort [12647]	Endangered	Species or species habitat likely to occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat known to occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cross, Peppercross, Rubble Pepper-cross, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Prasophyllum atratum Three Hummock Leek-orchid [82677]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat may occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pseudocephalozia paludicola Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis rubenachii Arthur River Greenhood [64536]	Endangered	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Carinascincus orocryptus Heath Cool-skink, Mountain Skink [90209]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Tymanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Zearaja maugeana Maugean Skate, Port Davey Skate [83504]	Endangered	Species or species habitat known to occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20088]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC

Commonwealth Land Name	State
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC
Unknown	
Commonwealth Land - [21497]	VIC
Commonwealth Land - [60114]	TAS
Commonwealth Land - [21583]	VIC
Commonwealth Land - [60113]	TAS
Commonwealth Land - [22391]	VIC

Commonwealth Land Name	State
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21490]	VIC
Commonwealth Land - [60111]	TAS
Commonwealth Land - [21498]	VIC
Commonwealth Land - [60116]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [21492]	VIC
Commonwealth Land - [60112]	TAS
Commonwealth Land - [21489]	VIC
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [60346]	TAS
Commonwealth Land - [21582]	VIC

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic		
Cape Sorell Lighthouse	TAS	Listed place
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
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Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat likely to occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		

Current Scientific Name	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats		[Resource Information]
Name	Type of Presence	
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat	

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Tasman Fracture	Marine National Park Zone (IUCN II)	
Apollo	Multiple Use Zone (IUCN VI)	
Beagle	Multiple Use Zone (IUCN VI)	
Boags	Multiple Use Zone (IUCN VI)	
Franklin	Multiple Use Zone (IUCN VI)	
Tasman Fracture	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Aire River	Heritage River	VIC	
Aire River W.R.	Natural Features Reserve	VIC	
Aireys Inlet B.R.	Natural Features Reserve	VIC	
Albatross Island	Nature Reserve	TAS	
Anglesea B.R.	Natural Features Reserve	VIC	
Anser Island	Reference Area	VIC	
Arthur-Pieman	Conservation Area	TAS	
Arthur River Rd Marrawah	Conservation Covenant	TAS	
Arthurs Seat	State Park	VIC	
Badger Box Creek	Nature Reserve	TAS	
Badger River	Regional Reserve	TAS	
Bald Hills B.R.	Natural Features Reserve	VIC	
Barham Paradise S.R.	Natural Features Reserve	VIC	

Protected Area Name	Reserve Type	State
Barwon Bluff	Marine Sanctuary	VIC
Bass Pyramid	Nature Reserve	TAS
Bass River SS.R.	Natural Features Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Bellarine I109 B.R.	Natural Features Reserve	VIC
Bellarine I110 B.R.	Natural Features Reserve	VIC
Bird Island	Game Reserve	TAS
Black Pyramid Rock	Nature Reserve	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Cape Howe	Marine National Park	VIC
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Sorell	Historic Site	TAS
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS

Protected Area Name	Reserve Type	State
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corinella Cemetery B.R.	Natural Features Reserve	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Croajingolong	National Park	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Deep Lagoons	Conservation Area	TAS
Devils Tower	Nature Reserve	TAS
Disappointment Bay	State Reserve	TAS
Discovery Bay Coastal Park	Conservation Park	VIC
Dromana B.R.	Natural Features Reserve	VIC
Eagle Rock	Marine Sanctuary	VIC
East Moncoeur Island	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Fingal B.R	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Four Mile Beach	Regional Reserve	TAS
French Island	National Park	VIC
Gentle Annie	Conservation Area	TAS
Gorae B.R.	Natural Features Reserve	VIC
Grantville N.C.R	Natural Features Reserve	VIC
Great Otway	National Park	VIC
Harbour Islets	Conservation Area	TAS
Henderson Islets	Conservation Area	TAS
Hogan Group	Conservation Area	TAS
Hunter Island	Conservation Area	TAS
Johanna Falls S.R.	Natural Features Reserve	VIC
Kentford Forest	Conservation Area	TAS
Kentford Forest	Nature Reserve	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Kings Run	Private Nature Reserve	TAS
Kings Run #2	Conservation Covenant	TAS
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Gilleear W.R	Natural Features Reserve	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Little Trefoil	Conservation Area	TAS
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lymwood	Conservation Covenant	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC
Millwood Road	Conservation Covenant	TAS
Mornington Peninsula	National Park	VIC
Mount Dundas	Regional Reserve	TAS
Mount Heemskirk	Regional Reserve	TAS
Mount Vereker Creek	Natural Catchment Area	VIC
Muddy Lagoon	Nature Reserve	TAS
Murkay Islets	Conservation Area	TAS
Mushroom Reef	Marine Sanctuary	VIC
Nares Rocks	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Narrawong F.R.	Nature Conservation Reserve	VIC
New Year Island	Game Reserve	TAS
North East Islet	Nature Reserve	TAS
Ocean Beach	Conservation Area	TAS
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Pegarah	Private Nature Reserve	TAS
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Penguin Islet	Nature Reserve	TAS
Petrel Islands	Game Reserve	TAS
Phillip Island Nature Park	Other	VIC
Pieman River	State Reserve	TAS
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rodondo Island	Nature Reserve	TAS
Rosebud B.R.	Natural Features Reserve	VIC
Sartoris Rd Nugara	Conservation Covenant	TAS
Seacrow Islet	Conservation Area	TAS
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	Conservation Area	TAS
Seal Rocks	State Reserve	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Shell Islets	Conservation Area	TAS
Slaves Bay	Conservation Area	TAS
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Southwest	National Park	TAS
Southwest	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Stack Island	Game Reserve	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Strahan Customs House	Historic Site	TAS
Sugarloaf Rock	Conservation Area	TAS
Sundown Point	State Reserve	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tambar	Conservation Covenant	TAS
Tathams Lagoon	Conservation Area	TAS
Teepookana	Regional Reserve	TAS
The Arches	Marine Sanctuary	VIC
The Doughboys	Nature Reserve	TAS
Three Hummock Island	State Reserve	TAS
Tikkawoppa Plateau	Regional Reserve	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Trial Harbour	State Reserve	TAS
Tully River	Conservation Area	TAS
Twelve Apostles	Marine National Park	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed C0293	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC

Protected Area Name	Reserve Type	State
Waratah B.R	Natural Features Reserve	VIC
Warra Creek	Regional Reserve	TAS
Welcome River	State Reserve	TAS
West Moncoeur Island	Nature Reserve	TAS
West Point	State Reserve	TAS
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	Marine National Park	VIC
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilson's Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilson's Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Yambacoona	Conservation Covenant	TAS

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland RFA	Victoria
Gippsland RFA	Victoria
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Bungaree Lagoon	TAS
Corner Inlet	VIC
Lake Ashwood	TAS
Lake Bantick	TAS
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lake Garcia	TAS
Lavinia Nature Reserve	TAS
Lower Aire River Wetlands	VIC
Mud Islands	VIC
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Powlett River Mouth	VIC
Princetown Wetlands	VIC

Wetland Name	State
Shallow Inlet Marine & Coastal Park	VIC
Swan Bay & Swan Island	VIC
Tamboon Inlet Wetlands	VIC
Thurra River	VIC
Unnamed Wetland	TAS
Western Port	VIC

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Farming Expansion, Macquarie Harbour, TAS	2012/6406		Assessment
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Basalt Quarry Extension (Mountainview Quarry)	2004/1329	Controlled Action	Completed
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Dairy Farm expansion on the Woolnorth property	2013/6710	Controlled Action	Completed
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Geelong Salt Fields Urban Renewal Project	2012/6630	Controlled Action	Assessment Approach
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Heemskirk Windfarm Development	2002/678	Controlled Action	Completed
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Estate, 251-319 Melaluka Rd	2007/3308	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Residential Subdivision and Stormwater Enhancements for land west of Ash Road	2012/6544	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Tarkine Forest Drive Road Upgrade	2011/6210	Controlled Action	Post-Approval
The Tarkine Road Project	2009/5169	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Aquaculture facility for rainbow trout and yabbies and recreational facilities	2002/822	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Barwon River Parkland Initiative, Tait's Point, Stages 1 and 2	2010/5437	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of a Dwelling	2011/6160	Not Controlled Action	Completed
Construction of a flexi mat boat ramp	2011/5838	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Extension of Mountain View basalt quarry by 113 hectares (stage one)	2004/1591	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Geelong Bypass Sections 1 & 2	2005/2097	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Sparrovale Wetland stormwater management, Armstrong Creek and Charlemont, VIC	2018/8375	Not Controlled Action	Completed
Spikey Beach 1, West Triton Drilling Program, Bass Basin Permit T/38P	2007/3914	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Tenby Point Sewerage Pipeline	2001/406	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Upgrade of existing access track	2011/5933	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wastewater Treatment System Upgrade	2004/1420	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D & 3D seismic survey T/39P	2005/2237	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Collection of cast bull kelp	2002/813	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
development of retirement village, Bellarine Lakes Golf Course, Bellarine Hwy	2006/3015	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness PT 2	2006/3044	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness WHA	2004/1846	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Remove silt build up on existing swales around the perimeter of the Three Hummo	2010/5676	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Upgrade of Arthur River Road	2003/930	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Kelly Channel Discharge, Macquarie Harbour, Tasmania	2017/8057	Referral Decision	Completed
Land clearing for stock grazing	2005/2176	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Station	2008/4156	Referral Decision	Completed

Key Ecological Features [[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
Seamounts South and east of Tasmania	South-east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [[Resource Information](#)]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Seabirds		
Ardeanna grisea		
Sooty Shearwater [82651]	Foraging	Likely to occur
Ardeanna grisea		
Sooty Shearwater [82651]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Likely to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur

Bioregional Assessments

[[Resource Information](#)]

SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



T/49P LOWC Moderate EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	5
Wetlands of International Importance (Ramsar)	6
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	3
Listed Threatened Ecological Communities:	19
Listed Threatened Species:	196
Listed Migratory Species:	88

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	65
Commonwealth Heritage Places:	11
Listed Marine Species:	139
Whales and Other Cetaceans:	32
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	9
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	273
Regional Forest Agreements:	5
Nationally Important Wetlands:	34
EPBC Act Referrals:	300
Key Ecological Features (Marine):	6
Biologically Important Areas:	54
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status
Tasmanian Wilderness	TAS	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Natural

Tasmanian Wilderness	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Gippsland lakes	Within Ramsar site
Glenelg estuary and discovery bay wetlands	Within 10km of Ramsar site
Lavinia	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Feature Name

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities

[[Resource Information](#)]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community may occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community may occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat known to occur within area
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
Thymichthys politus Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Oreisplanus munionga larana Marrawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south- eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat likely to occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
PLANT		
Acacia caerulescens Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat may occur within area
Acacia constablei Narrabarba Wattle [10798]	Critically Endangered	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Astrotricha sp. Wigan Inlet (J.A.Jeanes 2268) Wigan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia campbellii Thick-stem Caladenia, Thick-stem Fairy Fingers [64857]	Critically Endangered	Species or species habitat may occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat likely to occur within area
Caladenia lindleyana Lindley's Spider-orchid [9305]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area
Centrolepis pedderensis Pedder Centrolepis, Pedder Bristlewort [12647]	Endangered	Species or species habitat likely to occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat likely to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat likely to occur within area
Correa lawrenceana var. genoensis Genoa River Correa [66626]	Endangered	Species or species habitat may occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat known to occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Deyeuxia ramosa Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cross, Peppercross, Rubble Pepper-cross, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat known to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum atratum Three Hummock Leek-orchid [82677]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pseudocephalozia paludicola Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis rubenachii Arthur River Greenhood [64536]	Endangered	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat may occur within area
Rutidosia leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra jonesii Sky-blue Sun-orchid [76352]	Endangered	Species or species habitat may occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat known to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Westringia davidii [19079]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Carinascincus orocryptus Heath Cool-skink, Mountain Skink [90209]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
SHARK		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Zearaja maugeana Maugean Skate, Port Davey Skate [83504]	Endangered	Species or species habitat known to occur within area

Listed Migratory Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
<i>Eretmochelys imbricata</i> Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<i>Eubalaena australis</i> as <i>Balaena glacialis australis</i> Southern Right Whale [40]	Endangered	Breeding known to occur within area
<i>Isurus oxyrinchus</i> Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
<i>Lagenorhynchus obscurus</i> Dusky Dolphin [43]		Species or species habitat likely to occur within area
<i>Lamna nasus</i> Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
<i>Megaptera novaeangliae</i> Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
<i>Mobula birostris</i> as <i>Manta birostris</i> Giant Manta Ray [90034]		Species or species habitat known to occur within area
<i>Natator depressus</i> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
<i>Orcinus orca</i> Killer Whale, Orca [46]		Species or species habitat likely to occur within area
<i>Physeter macrocephalus</i> Sperm Whale [59]		Species or species habitat may occur within area
<i>Rhincodon typus</i> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Migratory Terrestrial Species

Scientific Name	Threatened Category	Presence Text
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20084]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20083]	VIC
Defence - HMAS CERBERUS [20082]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20080]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20088]	VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - HMAS CERBERUS [20098]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC
Unknown	
Commonwealth Land - [21509]	VIC

Commonwealth Land Name	State
Commonwealth Land - [22391]	VIC
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60116]	TAS
Commonwealth Land - [60111]	TAS
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [60118]	TAS
Commonwealth Land - [21496]	VIC
Commonwealth Land - [21497]	VIC
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21582]	VIC
Commonwealth Land - [60346]	TAS
Commonwealth Land - [60135]	TAS
Commonwealth Land - [60133]	TAS
Commonwealth Land - [60134]	TAS
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [21489]	VIC
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21490]	VIC
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21498]	VIC

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	
Historic			
Cape Sorell Lighthouse	TAS	Listed place	

Name	State	Status
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Gabo Island Lighthouse	VIC	Listed place
HMAS Cerberus Central Area Group	VIC	Listed place
Montague Island Lighthouse	NSW	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Wilson's Promontory Lighthouse	VIC	Listed place

Natural

HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
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Bird

[Actitis hypoleucos](#)

Common Sandpiper [59309]

Species or species habitat known to occur within area

[Anous stolidus](#)

Common Noddy [825]

Species or species habitat likely to occur within area

[Anseranas semipalmata](#)

Magpie Goose [978]

Species or species habitat may occur within area overfly marine area

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat likely to occur within area overfly marine area

[Ardena carneipes as Puffinus carneipes](#)

Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]

Species or species habitat known to occur within area

[Ardena grisea as Puffinus griseus](#)

Sooty Shearwater [82651]

Vulnerable

Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat likely to occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Nator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Ziphius cavirostris		
Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats [\[Resource Information \]](#)

Name	Type of Presence
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Tasman Fracture	Marine National Park Zone (IUCN II)
Apollo	Multiple Use Zone (IUCN VI)
Beagle	Multiple Use Zone (IUCN VI)
Boags	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Tasman Fracture	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Nelson	Special Purpose Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Agnes Falls S.R.	Natural Features Reserve	VIC
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Aireys Inlet B.R.	Natural Features Reserve	VIC
Albatross Island	Nature Reserve	TAS
Anglesea B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Anser Island	Reference Area	VIC
Arthur-Pieman	Conservation Area	TAS
Arthur River Rd Marrawah	Conservation Covenant	TAS
Baawang	Reference Area	VIC
Badger Box Creek	Nature Reserve	TAS
Badger River	Regional Reserve	TAS
Bald Hills B.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bass Pyramid	Nature Reserve	TAS
Bass River SS.R.	Natural Features Reserve	VIC
Batemans	Marine Park	NSW
Bay of Islands Coastal Park	Conservation Park	VIC
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Ben Boyd	National Park	NSW
Bennison F.F.R.	Nature Conservation Reserve	VIC
Beware Reef	Marine Sanctuary	VIC
Bird Island	Game Reserve	TAS
Black Pyramid Rock	Nature Reserve	TAS
Black River	Conservation Area	TAS
Black River Bridge	Conservation Area	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Brashton Dairies #1	Conservation Covenant	TAS
Brashton Dairies #2	Conservation Covenant	TAS
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Brick Islands	Conservation Area	TAS
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Bull Rock	Conservation Area	TAS
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Cape Conran Coastal Park	Conservation Park	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Sorell	Historic Site	TAS
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corner Inlet	Marine National Park	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Crayfish Creek	Regional Reserve	TAS
Crib Point G228 B.R.	Natural Features Reserve	VIC
Crib Point G229 B.R.	Natural Features Reserve	VIC
Croajingolong	National Park	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Darriman H29 B.R	Natural Features Reserve	VIC
Deep Lagoons	Conservation Area	TAS
Devils Tower	Nature Reserve	TAS
Disappointment Bay	State Reserve	TAS
Discovery Bay Coastal Park	Conservation Park	VIC
Eagle Rock	Marine Sanctuary	VIC
East Gippsland Coastal streams	Natural Catchment Area	VIC

Protected Area Name	Reserve Type	State
East Moncoeur Island	Conservation Area	TAS
Edgcumbe Beach	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Entrance Point	Reference Area	VIC
Ewing Morass W.R	Natural Features Reserve	VIC
Fingal B.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Forwards Beach	Conservation Area	TAS
Four Mile Beach	Regional Reserve	TAS
Franklin River SS.R.	Natural Features Reserve	VIC
French Island	National Park	VIC
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC
Gentle Annie	Conservation Area	TAS
Gippsland Lakes Coastal Park	Conservation Park	VIC
Great Otway	National Park	VIC
Harbour Islets	Conservation Area	TAS
Harcus Island	Conservation Area	TAS
Harcus River Rd West Montagu	Conservation Covenant	TAS
Harcus River Road #4	Conservation Covenant	TAS
Harcus River Road Marrawah	Conservation Covenant	TAS
Henderson Islets	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Highfield	Historic Site	TAS
Hoddle Range F.R.	Nature Conservation Reserve	VIC
Hogan Group	Conservation Area	TAS
Hunter Island	Conservation Area	TAS
Jack Smith Lake W.R	Natural Features Reserve	VIC
Johanna Falls S.R.	Natural Features Reserve	VIC
Kangaroo Island	Conservation Area	TAS
Kentford Forest	Conservation Area	TAS
Kentford Forest	Nature Reserve	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Kings Run	Private Nature Reserve	TAS
Kings Run #2	Conservation Covenant	TAS
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Corringale W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Denison W.R	Natural Features Reserve	VIC
Lake Gilleard W.R	Natural Features Reserve	VIC
Lake Tyers S.P.	State Park	VIC
Latrobe B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Little Peggs Beach	State Reserve	TAS
Little Trefoil	Conservation Area	TAS
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lymwood	Conservation Covenant	TAS
Lyons Cottage	Historic Site	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC
Millwood Road	Conservation Covenant	TAS
Mimosa Rocks	National Park	NSW
Montagu Beach	Conservation Area	TAS
Montague Island	Nature Reserve	NSW
Montagu Island	Conservation Area	TAS
Mornington Peninsula	National Park	VIC
Mount Dundas	Regional Reserve	TAS
Mount Heemskirk	Regional Reserve	TAS
Mount Vereker Creek	Natural Catchment Area	VIC
Muddy Lagoon	Nature Reserve	TAS
Murkay Islets	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Mushroom Reef	Marine Sanctuary	VIC
Nadgee	Nature Reserve	NSW
Nares Rocks	Conservation Area	TAS
Narrawong F.R.	Nature Conservation Reserve	VIC
New Year Island	Game Reserve	TAS
New Zealand Hill F.R.	Nature Conservation Reserve	VIC
Ninety Mile Beach	Marine National Park	VIC
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
North East Islet	Nature Reserve	TAS
Ocean Beach	Conservation Area	TAS
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Pegarah	Private Nature Reserve	TAS
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Peggs Beach	Conservation Area	TAS
Penguin Islet	Nature Reserve	TAS
Perkins Island	Conservation Area	TAS
Petrel Islands	Game Reserve	TAS
Phillip Island Nature Park	Other	VIC
Pieman River	State Reserve	TAS
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC

Protected Area Name	Reserve Type	State
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Rebecca Creek	Conservation Area	TAS
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rocky Cape	National Park	TAS
Rodondo Island	Nature Reserve	TAS
Sandpatch	Wilderness Zone	VIC
Sartoris Rd Nugara	Conservation Covenant	TAS
Seacrow Islet	Conservation Area	TAS
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS

Protected Area Name	Reserve Type	State
Sea Elephant River	Conservation Covenant	TAS
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	State Reserve	TAS
Seal Rocks	Conservation Area	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Shell Islets	Conservation Area	TAS
Slaves Bay	Conservation Area	TAS
Snowy River	Heritage River	VIC
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Southwest	National Park	TAS
Southwest	Conservation Area	TAS
Stack Island	Game Reserve	TAS
Stanley	Conservation Area	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Strahan Customs House	Historic Site	TAS
Sugarloaf Rock	Conservation Area	TAS
Sundown Point	State Reserve	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tambar	Conservation Covenant	TAS
Tarra Tarra B.R	Natural Features Reserve	VIC
Tathams Lagoon	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Tatlows Beach	Conservation Area	TAS
Teepookana	Regional Reserve	TAS
Temma	Conservation Covenant	TAS
The Arches	Marine Sanctuary	VIC
The Doughboys	Nature Reserve	TAS
The Nut	State Reserve	TAS
Three Hummock Island	State Reserve	TAS
Tikkawoppa Plateau	Regional Reserve	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Trial Harbour	State Reserve	TAS
Tully River	Conservation Area	TAS
Twelve Apostles	Marine National Park	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed (Duck Bay)	Conservation Area	TAS
Unnamed C0293	Private Nature Reserve	VIC
Unnamed P0155	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Wallaby Islands	Conservation Area	TAS
Waratah B.R	Natural Features Reserve	VIC
Warra Creek	Regional Reserve	TAS
Welcome River	State Reserve	TAS

Protected Area Name	Reserve Type	State
Welshpool H17 B.R	Natural Features Reserve	VIC
West Inlet	Conservation Area	TAS
West Moncoeur Island	Nature Reserve	TAS
West Point	State Reserve	TAS
Whipstick Gully N.F.R.	Natural Features Reserve	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
William Hunter F.R	Nature Conservation Reserve	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Marine National Park	VIC
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilson's Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilson's Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonga Wonga South B.R	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC
Woodside H26 B.R.	Natural Features Reserve	VIC
Woodside H27 B.R	Natural Features Reserve	VIC
Woodside H28 B.R	Natural Features Reserve	VIC
Yambacoona	Conservation Covenant	TAS
Yanakie F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland RFA	Victoria
Eden RFA	New South Wales
Gippsland RFA	Victoria
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Benedore River	VIC
Bungaree Lagoon	TAS
Corner Inlet	VIC
Ewing's Marsh (Morass)	VIC

Wetland Name	State
Jack Smith Lake State Game Reserve	VIC
Lake Ashwood	TAS
Lake Bantick	TAS
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lake Garcia	TAS
Lake Tyers	VIC
Lavinia Nature Reserve	TAS
Lower Aire River Wetlands	VIC
Lower Snowy River Wetlands System	VIC
Mallacoota Inlet Wetlands	VIC
Mud Islands	VIC
Nadgee Lake and tributary wetlands	NSW
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Rocky Cape Marine Area	TAS
Shallow Inlet Marine & Coastal Park	VIC
Snowy River	VIC
Swan Bay & Swan Island	VIC
Sydenham Inlet Wetlands	VIC
Tamboon Inlet Wetlands	VIC
Thurra River	VIC
Unnamed Wetland	TAS

Wetland Name	State
Western Port	VIC

EPBC Act Referrals	[Resource Information]
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Title of referral	Reference	Referral Outcome	Assessment Status
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Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Gelliondale Wind Farm Project	2023/09577		Assessment
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Farming Expansion, Macquarie Harbour, TAS	2012/6406		Assessment
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Robbins Island Renewable Energy Park, Robbins Island, Tasmania	2017/8096		Approval
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
South East Australia Carbon Capture and Storage Project, Onshore and State waters	2023/09731		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Crib Point to Pakenham Gas Pipeline, Vic	2018/8297	Controlled Action	Completed
Dairy Farm expansion on the Woolnorth property	2013/6710	Controlled Action	Completed
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Gas Import Facility, Crib Point, Vic	2018/8298	Controlled Action	Completed
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Heemskirk Windfarm Development	2002/678	Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Maintenance Dredging of Toora Boat Ramp Channel	2008/4376	Controlled Action	Completed
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Robbins Island Road to Hampshire Transmission Line	2020/8656	Controlled Action	Referral Decision
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Tarkine Forest Drive Road Upgrade	2011/6210	Controlled Action	Post-Approval
Tasmania Natural Gas Project - Stage 2	2001/211	Controlled Action	Post-Approval
The Tarkine Road Project	2009/5169	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Western Plains wind farm	2010/5712	Controlled Action	Assessment Approach
White Rock Wind Farm	2003/986	Controlled Action	Completed
Windfarm	2003/1109	Controlled Action	Completed
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Acquistion of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Aquaculture facility for rainbow trout and yabbies and recreational facilities	2002/822	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Bass Basin - Pee Jay-1 - Drilling Program	2007/3908	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
Dredging of Tuross Lake channel and depositon of spoil in lake	2004/1554	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Duck Irrigation System, north-west coast Tasmania	2016/7778	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Eden Wind Farm	2011/6037	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Fabrication and Spooling of Pipe Strings at Crib Point	2008/4127	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 3.5kW Wind Turbine	2012/6604	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance dredging of Yaringa Channel	2004/1360	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Pipeline easement regrowth removal	2011/5817	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Latta Wind Farm, Tas	2018/8249	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Port Welshpool Harbour Dredging	2007/3521	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Spikey Beach 1, West Triton Drilling Program, Bass Basin Permit T/38P	2007/3914	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
To undertake maintenance dredging of the Toora Boat Ramp Channel, VIC	2014/7225	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D & 3D seismic survey T/39P	2005/2237	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bitumen Storage Facility	2007/3676	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Collection of cast bull kelp	2002/813	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness PT 2	2006/3044	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness WHA	2004/1846	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Maintenance dredging of 150,000 cubic metres of sediment in Burnie Port and du	2004/1569	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Removal of Tasmanian blue gums	2004/1356	Not Controlled Action (Particular Manner)	Post-Approval
Remove silt build up on existing swales around the perimeter of the Three Hummo	2010/5676	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Soil and Organic Recycling Facility	2005/2216	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Upgrade of Arthur River Road	2003/930	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Wilson's Creek Bridge Replacement, Bass Highway	2007/3892	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Kelly Channel Discharge, Macquarie Harbour, Tasmania	2017/8057	Referral Decision	Completed
Land clearing for stock grazing	2005/2176	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
Upgrade of Corringale Road	2009/4825	Referral Decision	Completed
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Station	2008/4156	Referral Decision	Completed

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Bonney Coast Upwelling	South-east
Seamounts South and east of Tasmania	South-east
Shelf rocky reefs	Temperate east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [[Resource Information](#)]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Seabirds		
Ardenna carneipes		
Flesh-footed Shearwater [82404]	Foraging	Known to occur
Ardenna grisea		
Sooty Shearwater [82651]	Breeding	Known to occur
Ardenna grisea		
Sooty Shearwater [82651]	Foraging	Likely to occur
Ardenna grisea		
Sooty Shearwater [82651]	Foraging	Known to occur
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Likely to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Likely to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Likely to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Macronectes giganteus Southern Giant Petrel [1060]	Foraging	Known to occur
Macronectes halli Northern Giant Petrel [1061]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Oceanites oceanites Wilson's Storm Petrel [1034]	Migration	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Likely to occur
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche cauta steadi White-capped Albatross [82344]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Likely to occur
Thalasseus bergii Crested Tern [83000]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Thalasseus bergii Crested Tern [83000]	Foraging	Likely to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur

SubRegion

BioRegion

Website

Gippsland

Gippsland Basin

[BA website](#)

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

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T/49P LOWC Low EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	6
Wetlands of International Importance (Ramsar)	12
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	5
Listed Threatened Ecological Communities:	24
Listed Threatened Species:	266
Listed Migratory Species:	94

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	173
Commonwealth Heritage Places:	27
Listed Marine Species:	151
Whales and Other Cetaceans:	34
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	2
Australian Marine Parks:	16
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	554
Regional Forest Agreements:	6
Nationally Important Wetlands:	92
EPBC Act Referrals:	448
Key Ecological Features (Marine):	7
Biologically Important Areas:	60
Bioregional Assessments:	2
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status
Tasmanian Wilderness	TAS	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Recherche Bay (North East Peninsula) Area	TAS	Listed place
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Natural

Tasmanian Wilderness	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
East coast cape barren island lagoons	Within Ramsar site
Edithvale-seaford wetlands	Within 10km of Ramsar site
Flood plain lower ringarooma river	Within Ramsar site
Gippsland lakes	Within Ramsar site
Glenelg estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Little waterhouse lake	Within Ramsar site
Logan lagoon	Within Ramsar site
Piccaninnie ponds karst wetlands	Within 10km of Ramsar site

Ramsar Site Name	Proximity
Port Phillip bay (western shoreline) and Bellarine Peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [[Resource Information](#)]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

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Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [[Resource Information](#)]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community likely to occur within area
Araluen Scarp Grassy Forest	Endangered	Community may occur within area
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived	Critically Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Native Grassland		

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
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BIRD

Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pardalotus quadragintus Forty-spotted Pardalote [418]	Endangered	Foraging, feeding or related behaviour known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Breeding known to occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat known to occur within area
Engaeus granulatus Central North Burrowing Crayfish [78959]	Endangered	Species or species habitat known to occur within area
Engaeus martigener Furneaux Burrowing Crayfish [67220]	Endangered	Species or species habitat known to occur within area
Engaeus yabbimunna Burnie Burrowing Crayfish [66781]	Vulnerable	Species or species habitat known to occur within area
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Brachionichthys hirsutus Spotted Handfish [64418]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Brachiopsilus ziebelli Ziebell's Handfish, Waterfall Bay Handfish [83757]	Vulnerable	Species or species habitat likely to occur within area
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Mordacia praecox Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Nannoperca variegata Variegated Pygmy Perch, Ewens Pygmy Perch, Golden Pygmy Perch [26178]	Vulnerable	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
Thymichthys politus Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat known to occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Antipodia chaostola leucophaea Tasmanian Chaostola Skipper, Heath- sand Skipper [77672]	Endangered	Species or species habitat known to occur within area
Oreisplanus munionga larana Marrawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat likely to occur within area

MAMMAL

Scientific Name	Threatened Category	Presence Text
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus viverrinus Eastern Quoll, Luaner [333]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
<i>Miniopterus orianae bassanii</i> Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
<i>Mirounga leonina</i> Southern Elephant Seal [26]	Vulnerable	Breeding may occur within area
<i>Neophoca cinerea</i> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
<i>Perameles gunnii gunnii</i> Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat known to occur within area
<i>Perameles gunnii</i> Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
<i>Petauroides volans</i> Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
<i>Petaurus australis australis</i> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
<i>Potorous longipes</i> Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
<i>Potorous tridactylus trisulcatus</i> Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
<i>Pseudomys fumeus</i> Smoky Mouse, Koonoom [88]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
OTHER		
Dendronephthya australis Cauliflower Soft Coral [90325]	Endangered	Species or species habitat known to occur within area
Hyridella glenelgensis Glenelg Freshwater Mussel [82953]	Critically Endangered	Species or species habitat may occur within area
Megascolides australis Giant Gippsland Earthworm [64420]	Vulnerable	Species or species habitat may occur within area
PLANT		
Acacia caerulescens Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia constablei Narrabarba Wattle [10798]	Critically Endangered	Species or species habitat known to occur within area
Acacia georgensis Bega Wattle [9848]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Astrotricha crassifolia Thick-leaf Star-hair [10352]	Vulnerable	Species or species habitat may occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268) Wingan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Banksia vincentia [88276]	Critically Endangered	Species or species habitat known to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia campbellii Thick-stem Caladenia, Thick-stem Fairy Fingers [64857]	Critically Endangered	Species or species habitat known to occur within area
Caladenia caudata Tailed Spider-orchid [17067]	Vulnerable	Species or species habitat known to occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat known to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider- orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat known to occur within area
Caladenia lindleyana Lindley's Spider-orchid [9305]	Critically Endangered	Species or species habitat known to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat likely to occur within area
Caladenia pallida Rosy Spider Orchid, Pale Spider-orchid, Summer Spider-orchid [9604]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia pumila Dwarf Spider-orchid [4155]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Caladenia tonellii Robust Fingers [64861]	Critically Endangered	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Cassinia rugata Wrinkled Cassinia, Wrinkled Dollybush [21885]	Vulnerable	Species or species habitat may occur within area
Centrolepis pedderensis Pedder Centrolepis, Pedder Bristlewort [12647]	Endangered	Species or species habitat likely to occur within area
Colobanthus curtisiae Curtis' Colobanth [23961]	Vulnerable	Species or species habitat may occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat known to occur within area
Conospermum hookeri Variable Smoke-bush [68161]	Vulnerable	Species or species habitat likely to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat known to occur within area
Correa lawrenceana var. genoensis Genoa River Correa [66626]	Endangered	Species or species habitat may occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat known to occur within area
Corunastylis rhyolitica listed as Genoplesium rhyoliticum Pambula Midge-orchid, Rhyolite Midge Orchid [78697]	Endangered	Species or species habitat likely to occur within area
Corunastylis vernalis listed as Genoplesium vernale East Lynne Midge-orchid [78699]	Vulnerable	Species or species habitat known to occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Deyeuxia ramosa Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area
Diuris basaltica Small Golden Moths Orchid, Early Golden Moths [64654]	Endangered	Species or species habitat may occur within area
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat known to occur within area
Epacris graniticola Mt Cameron Heath, Granite Heath [82822]	Critically Endangered	Species or species habitat may occur within area
Epacris stuartii Stuart's Heath, Southport Heath [10348]	Critically Endangered	Species or species habitat known to occur within area
Epacris virgata Pretty Heath, Dan Hill Heath [20375]	Endangered	Species or species habitat known to occur within area
Eucalyptus stenostoma Jillaga Ash [3976]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia amphisysepala Shiny Cliff Eyebright [4534]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Euphrasia fragosa Shy Eyebright, Southport Eyebright [64901]	Critically Endangered	Species or species habitat known to occur within area
Euphrasia gibbsiae subsp. psilantherea Swamp Eyebright [21507]	Critically Endangered	Species or species habitat known to occur within area
Euphrasia phragmostoma Bufton's Eyebright, Hairy Cliff Eyebright [7720]	Vulnerable	Species or species habitat known to occur within area
Euphrasia semipicta Peninsula Eyebright [9986]	Endangered	Species or species habitat known to occur within area
Euphrasia sp. Bivouac Bay (W.R.Barker 7626 et al.) Masked Eyebright, Masked Cliff Eyebright [82044]	Endangered	Species or species habitat known to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat known to occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Leionema ralstonii [64926]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat known to occur within area
Lomatia tasmanica King's Lomatia [3745]	Critically Endangered	Species or species habitat known to occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum affine Jervis Bay Leek Orchid, Culburra Leek-orchid, Kinghorn Point Leek-orchid [2210]	Endangered	Species or species habitat known to occur within area
Prasophyllum apoxychilum Tapered Leek-orchid [64947]	Endangered	Species or species habitat known to occur within area
Prasophyllum atratum Three Hummock Leek-orchid [82677]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum castaneum Chestnut Leek-orchid [64948]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum robustum Robust Leek-orchid [12499]	Critically Endangered	Species or species habitat may occur within area
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat known to occur within area
Prostanthera galbraithiae Wellington Mintbush [64959]	Vulnerable	Species or species habitat known to occur within area
Pseudocephalozia paludicola Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Pterostylis rubenachii Arthur River Greenhood [64536]	Endangered	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat known to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat likely to occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Spyridium obcordatum Creeping Dusty Miller [17447]	Vulnerable	Species or species habitat known to occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area
Taraxacum cygnorum Coast Dandelion, Native Dandelion [2508]	Vulnerable	Species or species habitat may occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra jonesii Sky-blue Sun-orchid [76352]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat known to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Triplarina nowraensis Nowra Heath-myrtle [64544]	Endangered	Species or species habitat known to occur within area
Westringia davidii [19079]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Xanthorrhoea arenaria Sand Grasstree [21603]	Vulnerable	Species or species habitat likely to occur within area
Xanthorrhoea bracteata Shiny Grasstree [7950]	Endangered	Species or species habitat known to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
Zieria tuberculata Warty Zieria [56736]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Carinascincus microlepidotus Boulder Cool-skink, Southern Snow Skink [90207]	Endangered	Species or species habitat known to occur within area
Carinascincus orocryptus Heath Cool-skink, Mountain Skink [90209]	Endangered	Species or species habitat likely to occur within area
Carinascincus palfreymani Pedra Branca Skink, Pedra Branca Cool-skink, Red-throated Skink [90203]	Critically Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Endangered	Species or species habitat may occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Tymanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area
SEASTAR		
Parvulastra vivipara Tasmanian Live-bearing Seastar [85451]	Vulnerable	Species or species habitat known to occur within area
SHARK		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Zearaja maugeana Maugean Skate, Port Davey Skate [83504]	Endangered	Species or species habitat known to occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Phocoena dioptrica Spectacled Porpoise [66728]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Sympsiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Australian National University	
Commonwealth Land - Australian National University [12024]	NSW
Commonwealth Land - Australian National University [12022]	NSW

Commonwealth Land Name	State
Commonwealth Land - Australian National University [12021]	NSW
Commonwealth Land - Australian National University [12023]	NSW
Commonwealth Land - Australian National University [12019]	NSW
Commonwealth Land - Australian National University [15737]	NSW
Commonwealth Trading Bank of Australia	
Commonwealth Land - Commonwealth Trading Bank of Australia [12020]	NSW
Communications, Information Technology and the Arts - Australian Postal Corporation	
Commonwealth Land - Australian Postal Commission [12052]	NSW
Communications, Information Technology and the Arts - Telstra Corporation Limited	
Commonwealth Land - Australian Telecommunications Commission [12025]	NSW
Commonwealth Land - Australian Telecommunications Commission [12050]	NSW
Commonwealth Land - Australian Telecommunications Commission [12053]	NSW
Commonwealth Land - Australian Telecommunications Commission [15611]	NSW
Commonwealth Land - Australian Telecommunications Commission [12265]	NSW
Commonwealth Land - Australian Telecommunications Commission [12049]	NSW
Commonwealth Land - Australian Telecommunications Commission [15461]	NSW
Commonwealth Land - Australian Telecommunications Commission [12014]	NSW
Commonwealth Land - Australian Telecommunications Commission [15430]	NSW
Commonwealth Land - Australian Telecommunications Commission [12038]	NSW
Commonwealth Land - Australian Telecommunications Commission [16089]	NSW
Commonwealth Land - Australian Telecommunications Commission [15535]	NSW
Commonwealth Land - Telstra Corporation Limited [12051]	NSW
Commonwealth Land - Telstra Corporation Limited [15888]	NSW

Defence

Commonwealth Land Name	State
Defence - AIRTC GEELONG [21354]	VIC
Defence - BEECROFT RAPIER RANGE [10049]	NSW
Defence - BEECROFT RAPIER RANGE [10048]	NSW
Defence - BEECROFT RAPIER RANGE [10050]	NSW
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - DEVONPORT TRAINING DEPOT [60011]	TAS
Defence - DEVONPORT TRAINING DEPOT [60009]	TAS
Defence - DEVONPORT TRAINING DEPOT [60008]	TAS
Defence - DEVONPORT TRAINING DEPOT [60010]	TAS
Defence - DUTSON BOMBING RANGE [20038]	VIC
Defence - DUTSON BOMBING RANGE [20061]	VIC
Defence - DUTSON BOMBING RANGE [20062]	VIC
Defence - DUTSON BOMBING RANGE [20034]	VIC
Defence - DUTSON BOMBING RANGE [20035]	VIC
Defence - DUTSON BOMBING RANGE [20033]	VIC
Defence - DUTSON BOMBING RANGE [20037]	VIC
Defence - DUTSON BOMBING RANGE [20036]	VIC
Defence - HMAS CERBERUS [20082]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20083]	VIC
Defence - HMAS CERBERUS [20080]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20089]	VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20088]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20098]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20084]	VIC
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - Myers Street (opp. Geelong Hospital) [20450]	VIC
Defence - POINT WILSON EXPLOSIVES AREA [21441]	VIC
Defence - POINT WILSON EXPLOSIVES AREA [21442]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STONYHEAD TRAINING AREA [60026]	TAS

Commonwealth Land Name	State
Defence - STONYHEAD TRAINING AREA [60025]	TAS
Defence - SUSSEX INLET - DEFENCE RESERVE [11233]	NSW
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC

Environment and Heritage

Commonwealth Land Name	State
Commonwealth Land - Booderee National Park [91004]	JBT
Commonwealth Land - Booderee National Park [91002]	JBT
Commonwealth Land - Booderee National Park [91005]	JBT
Commonwealth Land - Booderee National Park [91001]	JBT
Commonwealth Land - Booderee National Park [91003]	JBT
Unknown	
Commonwealth Land - [60111]	TAS
Commonwealth Land - [60074]	TAS
Commonwealth Land - [21590]	VIC
Commonwealth Land - [21498]	VIC
Commonwealth Land - [21591]	VIC
Commonwealth Land - [60127]	TAS
Commonwealth Land - [60122]	TAS
Commonwealth Land - [60125]	TAS
Commonwealth Land - [60124]	TAS
Commonwealth Land - [60129]	TAS
Commonwealth Land - [60128]	TAS
Commonwealth Land - [60064]	TAS
Commonwealth Land - [60067]	TAS
Commonwealth Land - [22390]	VIC
Commonwealth Land - [60134]	TAS
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21582]	VIC
Commonwealth Land - [21589]	VIC
Commonwealth Land - [60346]	TAS
Commonwealth Land - [60135]	TAS
Commonwealth Land - [60138]	TAS

Commonwealth Land Name	State
Commonwealth Land - [60136]	TAS
Commonwealth Land - [60137]	TAS
Commonwealth Land - [60133]	TAS
Commonwealth Land - [60130]	TAS
Commonwealth Land - [22391]	VIC
Commonwealth Land - [12041]	NSW
Commonwealth Land - [12042]	NSW
Commonwealth Land - [12045]	NSW
Commonwealth Land - [12046]	NSW
Commonwealth Land - [12047]	NSW
Commonwealth Land - [60126]	TAS
Commonwealth Land - [21488]	VIC
Commonwealth Land - [60181]	TAS
Commonwealth Land - [21507]	VIC
Commonwealth Land - [60157]	TAS
Commonwealth Land - [60156]	TAS
Commonwealth Land - [60154]	TAS
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21508]	VIC
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21490]	VIC
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21496]	VIC
Commonwealth Land - [60118]	TAS
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21489]	VIC

Commonwealth Land Name	State
Commonwealth Land - [60147]	TAS
Commonwealth Land - [60145]	TAS
Commonwealth Land - [60143]	TAS
Commonwealth Land - [60142]	TAS
Commonwealth Land - [60180]	TAS
Commonwealth Land - [21497]	VIC
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60116]	TAS
Commonwealth Land - [60148]	TAS
Commonwealth Land - [60179]	TAS
Commonwealth Land - [60177]	TAS
Commonwealth Land - [60178]	TAS
Commonwealth Land - [60065]	TAS
Commonwealth Land - [60066]	TAS
Commonwealth Land - [60173]	TAS

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	
Historic			
Cape Sorell Lighthouse	TAS	Listed place	
Cape St George Lighthouse Ruins & Curtilage	ACT	Listed place	
Cape Wickham Lighthouse	TAS	Listed place	
Christians Minde Settlement	ACT	Listed place	
Eddystone Lighthouse	TAS	Listed place	
Fort Queenscliff	VIC	Listed place	
Gabo Island Lighthouse	VIC	Listed place	

Name	State	Status
Goose Island Lighthouse	TAS	Listed place
HMAS Cerberus Central Area Group	VIC	Listed place
Jervis Bay Botanic Gardens	ACT	Listed place
Mersey Bluff Lighthouse	TAS	Listed place
Montague Island Lighthouse	NSW	Listed place
Point Perpendicular Lightstation	NSW	Listed place
Royal Australian Naval College	ACT	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Swan Island Lighthouse	TAS	Listed place
Table Cape Lighthouse	TAS	Listed place
Tasman Island Lighthouse	TAS	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place

Indigenous

Crocodile Head Area	NSW	Within listed place
Jervis Bay Territory	ACT	Listed place

Natural

Beecroft Peninsula	NSW	Listed place
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Point Wilson Defence Natural Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place
Tasmanian Seamounts Area	EXT	Listed place

Listed Marine Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
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Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardena pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Breeding known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Sterna striata White-fronted Tern [799]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Breeding known to occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Mirounga leonina Southern Elephant Seal [26]	Vulnerable	Breeding may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans [\[Resource Information \]](#)

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Ginkgo-toothed Beaked Whale, Ginkgo-toothed Whale, Ginkgo Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Phocoena dioptrica Spectacled Porpoise [66728]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats [\[Resource Information \]](#)

Name	Type of Presence
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat

Commonwealth Reserves Terrestrial [\[Resource Information \]](#)

Name	State	Type
Booderee	JBT	Botanic Gardens (Commonwealth)
Booderee	JBT	National Park (Commonwealth)

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
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Park Name	Zone & IUCN Categories
Huon	Habitat Protection Zone (IUCN IV)
Flinders	Marine National Park Zone (IUCN II)
Tasman Fracture	Marine National Park Zone (IUCN II)
Apollo	Multiple Use Zone (IUCN VI)
Beagle	Multiple Use Zone (IUCN VI)
Boags	Multiple Use Zone (IUCN VI)
East Gippsland	Multiple Use Zone (IUCN VI)
Flinders	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Huon	Multiple Use Zone (IUCN VI)
Tasman Fracture	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Nelson	Special Purpose Zone (IUCN VI)
Tasman Fracture	Special Purpose Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)
Jervis	Special Purpose Zone (Trawl) (IUCN VI)

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Actaeon Island	Game Reserve	TAS	
Agnes Falls S.R.	Natural Features Reserve	VIC	
Aire River	Heritage River	VIC	
Aire River W.R.	Natural Features Reserve	VIC	

Protected Area Name	Reserve Type	State
Aireys Inlet B.R.	Natural Features Reserve	VIC
Albatross Island	Nature Reserve	TAS
Anderson Islands	Conservation Area	TAS
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthur Bay	Conservation Area	TAS
Arthur-Pieman	Conservation Area	TAS
Arthur River Rd Marrawah	Conservation Covenant	TAS
Arthurs Seat	State Park	VIC
Baawang	Reference Area	VIC
Babel Island	Indigenous Protected Area	TAS
Badger Box Creek	Nature Reserve	TAS
Badger Head	Conservation Covenant	TAS
Badger Island	Indigenous Protected Area	TAS
Badger River	Regional Reserve	TAS
Balcombe Creek B.R.	Natural Features Reserve	VIC
Bald Hill N.C.R	Natural Features Reserve	VIC
Bald Hills B.R.	Natural Features Reserve	VIC
Balnarring G95 B.R.	Natural Features Reserve	VIC
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bass Pyramid	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Bass River SS.R.	Natural Features Reserve	VIC
Batemans	Marine Park	NSW
Bats Ridge W.R	Nature Conservation Reserve	VIC
Battery Island	Conservation Area	TAS
Baxter Island G.L.R.	Natural Features Reserve	VIC
Baynes Island	Nature Reserve	TAS
Bay of Islands Coastal Park	Conservation Park	VIC
Bellarine I109 B.R.	Natural Features Reserve	VIC
Bellarine I110 B.R.	Natural Features Reserve	VIC
Bell Bird Creek	Nature Reserve	NSW
Belowla Island	Nature Reserve	NSW
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Ben Boyd	National Park	NSW
Benedore River	Reference Area	VIC
Bennison F.F.R.	Nature Conservation Reserve	VIC
Bermagquee	Nature Reserve	NSW
Bermagui	Flora Reserve	NSW
Beware Reef	Marine Sanctuary	VIC
Biamanga	National Park	NSW
Big Bay	Conservation Area	TAS
Big Green Island	Nature Reserve	TAS
Big Silver	Conservation Covenant	TAS
Bird Island	Game Reserve	TAS
Bittern B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Black Pyramid Rock	Nature Reserve	TAS
Black River	Conservation Area	TAS
Black River Bridge	Conservation Area	TAS
Blond Bay G.L.R.	Natural Features Reserve	VIC
Blond Bay W.R.	Natural Features Reserve	VIC
Blyth Point	Conservation Area	TAS
Boat Harbour Road Killiecrankie	Conservation Covenant	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Boobyalla	Conservation Area	TAS
Bournda	Nature Reserve	NSW
Bournda	National Park	NSW
Boxen Island	Conservation Area	TAS
Brashton Dairies #1	Conservation Covenant	TAS
Brashton Dairies #2	Conservation Covenant	TAS
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Briant Hill	Nature Recreation Area	TAS
Brick Islands	Conservation Area	TAS
Briggs	Regional Reserve	TAS
Briggs Islet	Conservation Area	TAS
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Brougham Sugarloaf	Conservation Area	TAS
Broulee Island	Nature Reserve	NSW

Protected Area Name	Reserve Type	State
Brush Island	Nature Reserve	NSW
Buckley N.C.R.	Natural Features Reserve	VIC
Bull Rock	Conservation Area	TAS
Bun Beetons Point	Conservation Area	TAS
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Burnett Point	Conservation Area	TAS
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Cameron	Regional Reserve	TAS
Cape Conran Coastal Park	Conservation Park	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Portland	Conservation Area	TAS
Cape Sorell	Historic Site	TAS
Cape Wickham	State Reserve	TAS
Cape Wickham	Conservation Area	TAS
Catamaran River	Conservation Area	TAS
Cataraqui Point	Conservation Area	TAS
Cat Island	Conservation Area	TAS
Chalky Island	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Chappell Islands	Nature Reserve	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Cloudy Bay Lagoon	Conservation Covenant	TAS
Cloudy Bay Lagoon	Marine Conservation Area	TAS
Cloudy Bay Road	Conservation Covenant	TAS
Clyde River	National Park	NSW
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Conjola	National Park	NSW
Corinella Cemetery B.R.	Natural Features Reserve	VIC
Corner Inlet	Marine National Park	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Craggy Island	Conservation Area	TAS
Crayfish Creek	Regional Reserve	TAS
Crib Point G228 B.R.	Natural Features Reserve	VIC
Crib Point G229 B.R.	Natural Features Reserve	VIC
Croajingolong	National Park	VIC

Protected Area Name	Reserve Type	State
Cullendulla Creek	Nature Reserve	NSW
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
D'Entrecasteaux Watering Place	Historic Site	TAS
Darling Range	Conservation Area	TAS
Darriman H29 B.R	Natural Features Reserve	VIC
Deen Maar	Indigenous Protected Area	VIC
Deep Lagoons	Conservation Area	TAS
Deua	National Park	NSW
Devilbend N.F.R.	Natural Features Reserve	VIC
Devils Tower	Nature Reserve	TAS
Dip Range	Regional Reserve	TAS
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Doctors Rocks	Conservation Area	TAS
Don Heads	Conservation Area	TAS
Double Creek	Natural Catchment Area	VIC
Double Sandy Point	Conservation Area	TAS
Doughboy Island	Conservation Area	TAS
Drakes B.R.	Natural Features Reserve	VIC
Dromana B.R.	Natural Features Reserve	VIC
Drumdlemara H1 B.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Drumdlemara H2 B.R	Natural Features Reserve	VIC
Drumdlemara H4 B.R	Natural Features Reserve	VIC
Duck River	Conservation Area	TAS
Eagle Rock	Marine Sanctuary	VIC
Eagles Claw	Nature Reserve	NSW
East Gippsland Coastal streams	Natural Catchment Area	VIC
East Kangaroo Island	Nature Reserve	TAS
East Moncoeur Island	Conservation Area	TAS
Eddystone Point Lighthouse	Historic Site	TAS
Edgcumbe Beach	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Egg Beach	Conservation Area	TAS
Eldorado	Conservation Area	TAS
Emita	Nature Recreation Area	TAS
Entrance Point	Reference Area	VIC
Eurobodalla	National Park	NSW
Ewing Morass W.R	Natural Features Reserve	VIC
Farm Cove	Game Reserve	TAS
Fingal B.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC
Five Mile Bluff	Conservation Area	TAS
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Flinders N.F.R.	Natural Features Reserve	VIC
Foochow	Conservation Area	TAS
Forsyth Island	Conservation Area	TAS
Forwards Beach	Conservation Area	TAS
Fossil Beach G.R.	Natural Features Reserve	VIC
Fossil Bluff	Conservation Area	TAS
Foster Islands	Nature Reserve	TAS
Fotheringate Bay	Conservation Area	TAS
Four Mile Beach	Regional Reserve	TAS
Franklin River SS.R.	Natural Features Reserve	VIC
Fraser Island G.L.R.	Natural Features Reserve	VIC
French Island	National Park	VIC
French Island	Marine National Park	VIC
French Island (east)	Reference Area	VIC
French Island (north)	Reference Area	VIC
French Island G230 B.R	Natural Features Reserve	VIC
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC
Gentle Annie	Conservation Area	TAS
George III Monument	Historic Site	TAS
George Rocks	Nature Reserve	TAS
Giffard H31 B.R	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Goose Island	Conservation Area	TAS
Goose Lagoon W.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Gorae B.R.	Natural Features Reserve	VIC
Grantville N.C.R	Natural Features Reserve	VIC
Great Dog Island	Indigenous Protected Area	TAS
Great Otway	National Park	VIC
Greens Beach	Conservation Area	TAS
Greens Beach Rd Greens Beach	Conservation Covenant	TAS
Gulaga	National Park	NSW
Gull Island	Conservation Area	TAS
Harbour Islets	Conservation Area	TAS
Harcus Island	Conservation Area	TAS
Harcus River Rd West Montagu	Conservation Covenant	TAS
Harcus River Road #4	Conservation Covenant	TAS
Harcus River Road Marrawah	Conservation Covenant	TAS
Hastings Bay	Conservation Area	TAS
Heathfield - Whalebone Way	Conservation Covenant	TAS
Hedditch Hill S.R.	Natural Features Reserve	VIC
Henderson Islets	Conservation Area	TAS
Highfield	Historic Site	TAS
Hippolyte Rocks	Marine Conservation Area	TAS
Hoddle Range F.R.	Nature Conservation Reserve	VIC
Hogan Group	Conservation Area	TAS
Holts Point	Conservation Area	TAS
Honeysuckle Avenue	Conservation Covenant	TAS
Hopkins Falls S.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Howie Island	Conservation Area	TAS
Hunter Island	Conservation Area	TAS
Ida Bay	State Reserve	TAS
Ida Bay	Conservation Covenant	TAS
Illawong	Nature Reserve	NSW
Inala	Conservation Covenant	TAS
Inala #2	Conservation Covenant	TAS
Isabella Island	Nature Reserve	TAS
Jack Smith Lake W.R	Natural Features Reserve	VIC
Jacksons Cove	Conservation Area	TAS
Jervis Bay	National Park	NSW
Jervis Bay	Marine Park	NSW
Johanna Falls S.R.	Natural Features Reserve	VIC
Johnstones Creek F.R	Nature Conservation Reserve	VIC
Kangaroo Island	Conservation Area	TAS
Kangerong N.C.R	Natural Features Reserve	VIC
Kentbruck H14 B.R	Natural Features Reserve	VIC
Kentbruck H50 B.R.	Natural Features Reserve	VIC
Kentford Forest	Nature Reserve	TAS
Kentford Forest	Conservation Area	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Killiecrankie	Nature Recreation Area	TAS

Protected Area Name	Reserve Type	State
Kings Run	Private Nature Reserve	TAS
Kings Run #2	Conservation Covenant	TAS
Kuhns Rd Memana	Conservation Covenant	TAS
Lackrana	Conservation Area	TAS
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Coleman W.R	Natural Features Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Corringale W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Denison W.R	Natural Features Reserve	VIC
Lake Gillear W.R	Natural Features Reserve	VIC
Lake Mikany	Conservation Area	TAS
Lake Tyers S.P.	State Park	VIC
Lands End	Conservation Covenant	TAS
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Lees Point	Conservation Area	TAS
Leongatha H3 B.R.	Natural Features Reserve	VIC
Leprena Trust - Sullivan Point	Conservation Covenant	TAS
Lighthouse Point	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Lime Pit Road	Conservation Area	TAS
Little Chalky Island	Conservation Area	TAS
Little Dog Island	Game Reserve	TAS
Little Green Island	Conservation Area	TAS
Little Island	Conservation Area	TAS
Little Peggs Beach	State Reserve	TAS
Little Silver	Conservation Covenant	TAS
Little Swan Island	Nature Reserve	TAS
Little Trefoil	Conservation Area	TAS
Little Waterhouse Island	Nature Reserve	TAS
Logan Lagoon	Conservation Area	TAS
Logan Lagoon	State Reserve	TAS
Logans Lagoon	Conservation Covenant	TAS
Long Island	Conservation Area	TAS
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lower Glenelg	National Park	VIC
Lower South East	Marine Park	SA
Low Head	Conservation Area	TAS
Low Head	Historic Site	TAS
Low Islets	Nature Reserve	TAS
Low Point	Conservation Area	TAS
Lughrata	Conservation Covenant	TAS
lungatalanana	Indigenous Protected Area	TAS

Protected Area Name	Reserve Type	State
Lymwood	Conservation Covenant	TAS
Lyons Cottage	Historic Site	TAS
Macquarie Harbour	Historic Site	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Mallacoota B.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Marriott Reef	Conservation Area	TAS
Marshall Beach	Conservation Area	TAS
Meroo	National Park	NSW
Merri	Marine Sanctuary	VIC
Merricks Creek B.R.	Natural Features Reserve	VIC
Mersey Bluff	State Reserve	TAS
Metung B.R.	Natural Features Reserve	VIC
Mile Island	Conservation Area	TAS
Millwood Road	Conservation Covenant	TAS
Mimosa Rocks	National Park	NSW
Montagu Beach	Conservation Area	TAS
Montague Island	Nature Reserve	NSW
Montagu Island	Conservation Area	TAS
Moriarty Rocks	Nature Reserve	TAS
Morley Swamp G.L.R.	Natural Features Reserve	VIC
Mornington Peninsula	National Park	VIC
Mortimers Paddock B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Mount Bruny	Conservation Area	TAS
Mount Chappell Island	Indigenous Protected Area	TAS
Mount Dundas	Regional Reserve	TAS
Mount Heemskirk	Regional Reserve	TAS
Mount Mangana	Conservation Area	TAS
Mount Martha N.C.R.	Natural Features Reserve	VIC
Mount Richmond	National Park	VIC
Mount Tanner	Nature Recreation Area	TAS
Mount Vereker Creek	Natural Catchment Area	VIC
Mount William	National Park	TAS
Mouzie B.R	Natural Features Reserve	VIC
Mouzie N.F.R	Natural Features Reserve	VIC
Muddy Lagoon	Nature Reserve	TAS
Mulligans Hill	Conservation Covenant	TAS
Mulligans Hill	Conservation Area	TAS
Mumbulla	Flora Reserve	NSW
Murkay Islets	Conservation Area	TAS
Murrah	Flora Reserve	NSW
Murramarang	National Park	NSW
Mushroom Reef	Marine Sanctuary	VIC
Musselroe Bay	Conservation Area	TAS
Nadgee	Nature Reserve	NSW
Narawntapu	National Park	TAS
Nares Rocks	Conservation Area	TAS
Narrawong F.R.	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Neds Reef	Conservation Area	TAS
New Year Island	Game Reserve	TAS
New Zealand Hill F.R.	Nature Conservation Reserve	VIC
Night Island	Conservation Area	TAS
Ninety Mile Beach	Marine National Park	VIC
Ninth Island	Conservation Area	TAS
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
North East Islet	Nature Reserve	TAS
North East River	Game Reserve	TAS
North Western Port N.C.R.	Natural Features Reserve	VIC
Nungurner B.R.	Natural Features Reserve	VIC
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC
Ocean Beach	Conservation Area	TAS
Olivers Creek B.R.	Natural Features Reserve	VIC
Oyster Rocks	Conservation Area	TAS
Painkalac Creek	Reference Area	VIC
Palana Beach	Nature Recreation Area	TAS
Pardoe Northdown	Conservation Area	TAS
Parker River	Reference Area	VIC
Pasco Group	Conservation Area	TAS
Passage Island	Conservation Area	TAS
Patriarchs	Conservation Area	TAS
Patriarchs	Private Sanctuary	TAS
Pegarah	Private Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Peggs Beach	Conservation Area	TAS
Pelican Island	Conservation Area	TAS
Penguin Islet	Nature Reserve	TAS
Perkins Island	Conservation Area	TAS
Petrel Islands	Game Reserve	TAS
Phillip Island Nature Park	Other	VIC
Pieman River	State Reserve	TAS
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Portarlington (Point Richard) F.F.R.	Nature Conservation Reserve	VIC
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Prime Seal Island	Conservation Area	TAS
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC

Protected Area Name	Reserve Type	State
Ram Island	Conservation Area	TAS
Raymond Island G.L.R.	Natural Features Reserve	VIC
Rebecca Creek	Conservation Area	TAS
Recherche Bay	Nature Recreation Area	TAS
Recherche Bay Reserve - Southport Lagoon Conservation Covenana	Conservation Covenant	TAS
Redbanks Sisters Creek	Conservation Covenant	TAS
Red Hill South B.R.	Natural Features Reserve	VIC
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reedy Lagoon	Private Nature Reserve	TAS
Reef Island	Conservation Area	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rigby Island G.L.R.	Natural Features Reserve	VIC
Ringarooma Tier - Rushy Lagoon	Conservation Covenant	TAS
Rocky Cape	National Park	TAS
Rodondo Island	Nature Reserve	TAS
Rosebud B.R.	Natural Features Reserve	VIC
Roydon Island	Conservation Area	TAS
Saintys Creek	Conservation Covenant	TAS
Salt Lagoon, St Leonards W.R	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Salt Lake - Backwater Morass G.L.R.	Natural Features Reserve	VIC
Sandpatch	Wilderness Zone	VIC
Sandridge	Conservation Covenant	TAS
Sartoris Rd Nugara	Conservation Covenant	TAS
Screw Creek N.C.R.	Natural Features Reserve	VIC
Seacrow Islet	Conservation Area	TAS
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	Conservation Area	TAS
Seal Rocks	State Reserve	TAS
Sellars Lagoon	Game Reserve	TAS
Sentinel Island	Conservation Area	TAS
Settlement Point	Conservation Area	TAS
Shag Lagoon	Conservation Area	TAS
Shakespeare Hills	Regional Reserve	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Shell Islets	Conservation Area	TAS
Single Tree Plain	Conservation Area	TAS
Sister Islands	Conservation Area	TAS
Sisters Beach	Conservation Covenant	TAS
Sisters Island	Conservation Area	TAS
Slaughterhouse Creek G.L.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Slaves Bay	Conservation Area	TAS
Snowy River	Heritage River	VIC
South Bruny	National Park	TAS
South East Forest	National Park	NSW
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Pats River	Conservation Area	TAS
Southport Lagoon	Conservation Area	TAS
South Rd Nugara	Conservation Covenant	TAS
Southwest	Conservation Area	TAS
Southwest	National Park	TAS
Spike Island	Conservation Area	TAS
Stack Island	Game Reserve	TAS
Stanley	Conservation Area	TAS
Steel Bay - Newland Backwater G.L.R.	Natural Features Reserve	VIC
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Storehouse Island	Conservation Area	TAS
Strahan Customs House	Historic Site	TAS
Strzelecki	National Park	TAS
Sugarloaf Rock	Conservation Area	TAS
Summer Camp	Conservation Area	TAS
Sundown Point	State Reserve	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Swan Reach Bay G.L.R.	Natural Features Reserve	VIC
Sydney Cove	Historic Site	TAS

Protected Area Name	Reserve Type	State
Table Cape	Conservation Area	TAS
Table Cape	State Reserve	TAS
Tambar	Conservation Covenant	TAS
Tambo Delta - Metung G.L.R.	Natural Features Reserve	VIC
Tanja	Flora Reserve	NSW
Tarra Tarra B.R	Natural Features Reserve	VIC
Tarwin Lower F.R.	Nature Conservation Reserve	VIC
Tasman	National Park	TAS
Tathams Lagoon	Conservation Area	TAS
Tatloes Beach	Conservation Area	TAS
Teepookana	Regional Reserve	TAS
Temma	Conservation Covenant	TAS
Tenth Island	Nature Reserve	TAS
The Arches	Marine Sanctuary	VIC
The Dock	Conservation Covenant	TAS
The Doughboys	Nature Reserve	TAS
The Dutchman	Conservation Area	TAS
The Lakes	National Park	VIC
The Nut	State Reserve	TAS
Three Hummock Island	State Reserve	TAS
Three Sisters-Goat Island	Nature Reserve	TAS
Tikkawoppa Plateau	Regional Reserve	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Tollgate Islands	Nature Reserve	NSW
Tower Hill W.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Trial Harbour	State Reserve	TAS
Trousers Point Beach	Conservation Area	TAS
Tully River	Conservation Area	TAS
Twelve Apostles	Marine National Park	VIC
Tyabb B.R.	Natural Features Reserve	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed (Badger Corner)	Conservation Area	TAS
Unnamed (Badger Head Road)	Conservation Area	TAS
Unnamed (Duck Bay)	Conservation Area	TAS
Unnamed C0293	Private Nature Reserve	VIC
Unnamed P0155	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Vansittart Island	Conservation Area	TAS
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Wallaby Islands	Conservation Area	TAS
Waratah B.R	Natural Features Reserve	VIC
Warneet Balaka St B.R.	Natural Features Reserve	VIC
Warneet Iluka St B.R.	Natural Features Reserve	VIC
Warneet N.F.R.	Natural Features Reserve	VIC
Warra Creek	Regional Reserve	TAS

Protected Area Name	Reserve Type	State
Warrengine Creek SS.R.	Natural Features Reserve	VIC
Waterfall-Fortescue	Marine Conservation Area	TAS
Waterhouse	Conservation Area	TAS
Waterhouse Island	Conservation Area	TAS
Wattle Point G.L.R.	Natural Features Reserve	VIC
Welcome River	State Reserve	TAS
Welshpool H17 B.R	Natural Features Reserve	VIC
West Coast Range	Regional Reserve	TAS
West Inlet	Conservation Area	TAS
West Moncoeur Island	Nature Reserve	TAS
West Point	State Reserve	TAS
Whalebone Way - Benbullen	Conservation Covenant	TAS
Whalebone Way - Lighthouse Road	Conservation Covenant	TAS
Whipstick Gully N.F.R.	Natural Features Reserve	VIC
White Beach	Conservation Area	TAS
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
William Hunter F.R	Nature Conservation Reserve	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	Marine National Park	VIC
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC

Protected Area Name	Reserve Type	State
Wilsons Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilsons Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wingaroo	Nature Reserve	TAS
Wongarra B.R.	Natural Features Reserve	VIC
Wonga Wonga South B.R	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC
Woodside H26 B.R.	Natural Features Reserve	VIC
Woodside H27 B.R	Natural Features Reserve	VIC
Woodside H28 B.R	Natural Features Reserve	VIC
Wright Rock	Nature Reserve	TAS
Wybalenna Island	Conservation Area	TAS
Yambacoona	Conservation Covenant	TAS
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC
Yanakie F.R	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Yaringa	Marine National Park	VIC
Youngs Creek	Conservation Area	TAS

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland RFA	Victoria
Eden RFA	New South Wales
Gippsland RFA	Victoria
Southern RFA	New South Wales
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands

[\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Beecroft Peninsula	NSW
Benedore River	VIC
Blackmans Lagoon	TAS
Bondi Lake	NSW
Boulanger Bay - Robbins Passage	TAS
Bungaree Lagoon	TAS
Clyde River Estuary	NSW
Coila Creek Delta	NSW
Corner Inlet	VIC
Cullendulla Creek and Embayment	NSW
Durras Lake	NSW
Ewing's Marsh (Morass)	VIC

Wetland Name	State
Fergusons Lagoon	TAS
Flyover Lagoon 1	TAS
Flyover Lagoon 2	TAS
Hogans Lagoon	TAS
Jack Smith Lake State Game Reserve	VIC
Jervis Bay	NSW
Jervis Bay Sea Cliffs	NSW
Lake Ashwood	TAS
Lake Bantick	TAS
Lake Bunga	VIC
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lake Garcia	TAS
Lake King Wetlands	VIC
Lake Tyers	VIC
Lake Victoria Wetlands	VIC
Lake Wellington Wetlands	VIC
Lavinia Nature Reserve	TAS
Little Thirsty Lagoon	TAS
Little Waterhouse Lake	TAS
Logan Lagoon	TAS
Long Swamp	VIC
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Lower Snowy River Wetlands System	VIC
Mallacoota Inlet Wetlands	VIC
Merimbula Lake	NSW

Wetland Name	State
Moruya River Estuary Saltmarshes	NSW
Mud Islands	VIC
Nadgee Lake and tributary wetlands	NSW
Nargal Lake	NSW
Nelson Lagoon	NSW
Pambula Estuarine Wetlands	NSW
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Rocky Cape Marine Area	TAS
Russells Swamp	VIC
Sellars Lagoon	TAS
Shallow Inlet Marine & Coastal Park	VIC
Snowy River	VIC
South East Cape Lakes	TAS
Stans Lagoon	TAS
St Georges Basin	NSW
Swan Bay & Swan Island	VIC
Swan Lagoon	NSW
Sydenham Inlet Wetlands	VIC
Syndicate Lagoon	TAS
Tamboon Inlet Wetlands	VIC
Tambo River (Lower Reaches) East Swamps	VIC
Thompsons Lagoon	TAS

Wetland Name	State
Thurra River	VIC
Tower Hill	VIC
Tregaron Lagoons 1	TAS
Tregaron Lagoons 2	TAS
Tuross River Estuary	NSW
Twofold Bay	NSW
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Unnamed Wetland	TAS
Waldrons Swamp	NSW
Wallaga Lake	NSW
Wallagoot Lagoon (Wallagoot Lake)	NSW
Werribee-Avalon Area	VIC
Western Port	VIC
Yambuk Wetlands	VIC

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
Armstrong Creek Aquatic Venue and Multi-sport Community Facility	2023/09553		Completed
Australian Centre for Disease Preparedness Part life Refit	2023/09497		Completed
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Bermagui Golf Club Proposed Subdivision (Stages 3-8)	2022/09242		Post-Approval
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Broulee Beach Estate residential development subdivision	2023/09551		Completed
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Creamery Road PSP Area Geelong West Property Development	2021/8939		Assessment
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Eurobodalla Regional Hospital	2023/09506		Completed
Geelong Hydrogen Hub	2022/09288		Referral Decision
Gelliondale Wind Farm Project	2023/09577		Assessment
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Farming Expansion, Macquarie Harbour, TAS	2012/6406		Assessment
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
North East Wind - construction and operation of wind turbines	2022/09388		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
and associated infrastructure			
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Proposed residential subdivision	2023/09632		Completed
Residential Development, Groves Road	2022/09357		Post-Approval
Robbins Island Renewable Energy Park, Robbins Island, Tasmania	2017/8096		Approval
Sassafras - Wesley Vale Irrigation Scheme Augmentation	2023/09666		Assessment
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
South East Australia Carbon Capture and Storage Project, Onshore and State waters	2023/09731		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Victorian Renewable Energy Terminal	2023/09609		Referral Decision
Vopak Victoria Energy Terminal	2023/09507		Assessment
Controlled action			
8 lot subdivision South Bruny Island	2010/5539	Controlled Action	Completed
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Basalt Quarry Extension (Mountainview Quarry)	2004/1329	Controlled Action	Completed
Boundary Road Quarry extension, Dromana, Vic	2018/8221	Controlled Action	Assessment Approach
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Construction of a factory for the production of ACV's	2007/3842	Controlled Action	Completed
Construction of NW Homemaker Shopping Centre	2009/4835	Controlled Action	Post-Approval
Crib Point to Pakenham Gas Pipeline, Vic	2018/8297	Controlled Action	Completed
Dairy Farm expansion on the Woolnorth property	2013/6710	Controlled Action	Completed
Develop an Offshore Tidal Energy Facility	2008/4518	Controlled Action	Completed
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Extension of Mountain View basalt quarry by 490 hectares (Stage 2)	2004/1590	Controlled Action	Post-Approval
Gas Import Facility, Crib Point, Vic	2018/8298	Controlled Action	Completed
Geelong Salt Fields Urban Renewal Project	2012/6630	Controlled Action	Assessment Approach
Gippsland Lakes Mosquito Control Aerial /Hovercraft Spraying	2001/491	Controlled Action	Completed
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Golden Beach Gas Project	2019/8513	Controlled Action	Post-Approval
Heemskirk Windfarm Development	2002/678	Controlled Action	Completed
Installation of replacement crude-condensate pipeline, Vic	2014/7202	Controlled Action	Post-Approval
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Low Head Wind Farm, TAS	2012/6450	Controlled Action	Post-Approval
Maintenance Dredging of Toora Boat Ramp Channel	2008/4376	Controlled Action	Completed
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Musselroe Wind Farm	2002/683	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Estate, 251-319 Melaluka Rd	2007/3308	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Residential Subdivision and Stormwater Enhancements for land west of Ash Road	2012/6544	Controlled Action	Completed
Residential Subdivision and Town Centre Development, Vincentia	2006/2927	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Rezoning of land and associated public works to facilitate residential development	2007/3448	Controlled Action	Completed
Robbins Island Road to Hampshire Transmission Line	2020/8656	Controlled Action	Referral Decision
Rural residential subdivision into 13 new allotments	2008/4505	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Tarkine Forest Drive Road Upgrade	2011/6210	Controlled Action	Post-Approval
Tasmania Natural Gas Project - Stage 2	2001/211	Controlled Action	Post-Approval
The Tarkine Road Project	2009/5169	Controlled Action	Completed
Thomson River Mercury Recovery Project	2010/5734	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
Upgrade and expansion of existing Yaringa Boat Harbour	2011/6014	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Viva Energy Gas Terminal Project	2020/8838	Controlled Action	Assessment Approach
Warralily - East Precinct Sparrowale Outfall, stormwater bypass channel, Armstrong Creek, Vic	2015/7553	Controlled Action	Post-Approval
Water Pipeline	2010/5327	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Western Plains wind farm	2010/5712	Controlled Action	Assessment Approach
Western Treatment Plant Environment Improvement Project (post Effluent Reuse Stage 2)	2002/688	Controlled Action	Post-Approval
White Rock Wind Farm	2003/986	Controlled Action	Completed
Windfarm	2003/1109	Controlled Action	Completed
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Wyndham Cove marina and residential development	2004/1331	Controlled Action	Post-Approval
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Acquisition of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Allmans Levee Track - Maintenance Work	2003/1053	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Aquaculture facility for rainbow trout and yabbies and recreational facilities	2002/822	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Barwon River Parkland Initiative, Taits Point, Stages 1 and 2	2010/5437	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Bass Basin - Pee Jay-1 - Drilling Program	2007/3908	Not Controlled Action	Completed
Bass Hwy upgrade - Sisters Hills midway between Wynyard and Smithton	2006/3007	Not Controlled Action	Completed
Batemans Bay Marina Redevelopment	2008/4265	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
Caswell Street - Moruya East	2020/8781	Not Controlled Action	Completed
Clearance of native vegetation to create fire breaks	2004/1534	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of 165 Megalitre Dam at "Boobyalla Park"	2004/1428	Not Controlled Action	Completed
Construction of a Dwelling	2011/6160	Not Controlled Action	Completed
Construction of a flexi mat boat ramp	2011/5838	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of distributor road Leeds Parade to Escort Way	2004/1379	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Conversion of the North Western Victoria rail system from broad gauge to standar	2002/657	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
d'Entrecasteaux sites in Tasmania	2006/2618	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
development of retirement resort	2004/1828	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Dial Blythe Irrigation Scheme, north-west Tasmania	2013/7058	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
DOFA weed eradication program at Goorooyaroo NSW	2003/1270	Not Controlled Action	Completed
Dredging of Tuross Lake channel and depositon of spoil in lake	2004/1554	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
Duck Irrigation System, north-west coast Tasmania	2016/7778	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Eco-Tourism Development	2001/442	Not Controlled Action	Completed
Ecotourism Facility	2007/3322	Not Controlled Action	Completed
Eden Wind Farm	2011/6037	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Erosion Trials - planting and pile program of >300 mangroves	2006/2856	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Expansion and upgrade of Biogas Utilisation Facilities at the Western Treatment	2005/2183	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Extension of Mountain View basalt quarry by 113 hectares (stage one)	2004/1591	Not Controlled Action	Completed
Fabrication and Spooling of Pipe Strings at Crib Point	2008/4127	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Floating Observation Platform, Tooradin Channel	2006/2766	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Geelong Bypass Sections 1 & 2	2005/2097	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
George Bass Drive Lilli Pilli Road Realignment	2021/8876	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Golf Course Extension	2001/215	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hayes Hill Ridge Wind Farm	2007/3437	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Illuka Residential Estate	2007/3224	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 3.5kW Wind Turbine	2012/6604	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance dredging of Yaringa Channel	2004/1360	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Milton/Ulladulla Sewerage Scheme	2001/251	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Mixed use residential development (Camdale Development)	2006/2634	Not Controlled Action	Completed
Multi-species Aquaculture Enterprise	2001/404	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Oceanlinx South Australia 1mW Greenwave Project	2012/6528	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Pioneer Road and bridge Duplication	2012/6291	Not Controlled Action	Completed
Pipeline easement regrowth removal	2011/5817	Not Controlled Action	Completed
Point Cooke Coastal Trail	2001/324	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Port Latta Wind Farm, Tas	2018/8249	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Port Welshpool Harbour Dredging	2007/3521	Not Controlled Action	Completed
Power Station	2001/239	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Re-alignment of Breakwater Road	2006/2762	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Regional Fast Rail Project - Geelong Country Works Package	2002/577	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Remote power generation project	2005/2287	Not Controlled Action	Completed
Removal of Strzelecki Gum as part of the Regional Fast Rail Project	2006/2936	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Development, 409 The Esplanade, St Leonards	2006/2950	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Restricted Recreation Facility - soccer pitch, stadium and associated parking	2006/3034	Not Controlled Action	Completed
Rotary peeled veneer mill and timber merchandising yard	2002/564	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Saline Recharge of meromictic Lake Fidler	2004/1334	Not Controlled Action	Completed
Ship to Ship Crude Oil Lightering	2001/271	Not Controlled Action	Completed
Simpsons Point Residential Development, Eco-Tourism Facility & Conservation Rese	2005/1959	Not Controlled Action	Completed
Sludge handling and biosolids management - Western Treatment Plant	2006/2620	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Sparrovale Wetland stormwater management, Armstrong Creek and Charlemont, VIC	2018/8375	Not Controlled Action	Completed
Spikey Beach 1, West Triton Drilling Program, Bass Basin Permit T/38P	2007/3914	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Subdivision for Residential development	2004/1823	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
Tenby Point Sewerage Pipeline	2001/406	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
The 3000 Acres, clearing and development of native vegetation	2006/3199	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Morningson Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
To undertake maintenance dredging of the Toora Boat Ramp Channel, VIC	2014/7225	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Upgrade of existing access track	2011/5933	Not Controlled Action	Completed
Upgrade of the existing Thornhill St Sewer Pump Station	2010/5618	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wastewater Treatment System Upgrade	2004/1420	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Wood Processing and Metallurgical Carbon Facility	2001/478	Not Controlled Action	Completed
Wooralla Drive pump station, pipeline and associated works	2005/2450	Not Controlled Action	Completed
Wreck Bay Housing Development	2001/299	Not Controlled Action	Completed
WTP 115E Lagoon Seawall, Western Treatment Plant WTP, Werribee Victoria	2019/8577	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D & 3D seismic survey T/39P	2005/2237	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey, EPP33	2004/1794	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Survey	2008/4131	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
2D Siesmic Marine Survey	2008/4074	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey	2008/4528	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Road Settlement Road to Reserve Road Duplication Project	2020/8737	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bitumen Storage Facility	2007/3676	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Church and School Development	2006/3185	Not Controlled Action (Particular Manner)	Post-Approval
Collection of cast bull kelp	2002/813	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construction of Stormwater Harvesting Dam, Anakie Road, Lovely Banks VIC	2009/5001	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Corio Bay Channel Safety Adjustment Program	2011/6208	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Development of Commercial Shellfish Aquaculture Leases within Jervis Bay	2013/6768	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
<u>Not controlled action (particular manner)</u>			
		Manner)	
development of retirement village, Bellarine Lakes Golf Course, Bellarine Hwy	2006/3015	Not Controlled Action (Particular Manner)	Post-Approval
DIDR01 Wetlands, Barwon Heads Road, Armstrong Creek	2020/8835	Not Controlled Action (Particular Manner)	Post-Approval
Drainage, Trenching & Cable Laying as Part of the Regional Fast Rail Project	2003/1133	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
extension of a sporting facility and upgrading of associated infrastructure	2004/1325	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Installation of a 17x6m floating pontoon adjacent to existing boat ramp	2009/4842	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness PT 2	2006/3044	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness WHA	2004/1846	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance dredging of 150,000 cubic metres of sediment in Burnie Port and du	2004/1569	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program	2009/4953	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Point Wilson Explosives Area Waterside Infrastructure Remediation	2012/6376	Not Controlled Action (Particular Manner)	Post-Approval
Rail Upgrades at Geelong Port Project	2010/5363	Not Controlled Action (Particular Manner)	Post-Approval
Regional Fibre Optic Project (RFOP)	2003/913	Not Controlled Action (Particular Manner)	Post-Approval
Removal of Tasmanian blue gums	2004/1356	Not Controlled Action (Particular Manner)	Post-Approval
Remove silt build up on existing swales around the perimeter of the Three Hummo	2010/5676	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Scottsdale Irrigation Scheme (SIS) - Tasmania	2017/7981	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey in Petroleum Permit Area EPP27	2002/648	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Soil and Organic Recycling Facility	2005/2216	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
supersonic missile launch facility	2000/120	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Three Capes Track	2011/6200	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Upgrade of Arthur River Road	2003/930	Not Controlled Action (Particular Manner)	Post-Approval
Vegetation clearance and residential subdivision near Mt Gambier	2004/1370	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Waterfront Facility at HMAS Creswell	2002/658	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Wilson's Creek Bridge Replacement, Bass Highway	2007/3892	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
2D Seismic Survey	2008/3978	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed
Beecroft Weapons Range Visitors Centre	2004/1322	Referral Decision	Completed
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Enlargement of existing farm dam to irrigate a vineyard	2004/1853	Referral Decision	Completed
Holloman 2010 Vic/P60 3D Seismic Acquisition Survey Program	2009/5251	Referral Decision	Completed
Kelly Channel Discharge, Macquarie Harbour, Tasmania	2017/8057	Referral Decision	Completed
Land clearing for stock grazing	2005/2176	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Mineral Exploration Ringarooma Bay	2012/6508	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
Upgrade of Corringale Road	2009/4825	Referral Decision	Completed
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm	2001/139	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Works to the buildings and surrounds at the former Point Nepean Quarantine Stati	2008/4156	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Bonney Coast Upwelling	South-east
Canyons on the eastern continental slope	Temperate east
Seamounts South and east of Tasmania	South-east
Shelf rocky reefs	Temperate east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur
Seabirds		
Ardena carneipes		
Flesh-footed Shearwater [82404]	Foraging	Known to occur
Ardena grisea		
Sooty Shearwater [82651]	Breeding	Known to occur
Ardena grisea		
Sooty Shearwater [82651]	Foraging	Known to occur
Ardena grisea		
Sooty Shearwater [82651]	Foraging	Likely to occur

Scientific Name	Behaviour	Presence
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Likely to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Macronectes giganteus Southern Giant Petrel [1060]	Foraging	Known to occur
Macronectes halli Northern Giant Petrel [1061]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Oceanites oceanites Wilson's Storm Petrel [1034]	Migration	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Likely to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Breeding	Known to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Sterna striata White-fronted Tern [799]	Breeding	Known to occur
Sterna striata White-fronted Tern [799]	Foraging	Known to occur
Thalassarche bulleri Buller's Albatross [64460]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche cauta steadi White-capped Albatross [82344]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging likely	Likely to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Likely to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Thalasseus bergii Crested Tern [83000]	Breeding	Known to occur
Thalasseus bergii Crested Tern [83000]	Foraging	Likely to occur
Seals		
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Known to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur

Bioregional Assessments [[Resource Information](#)]

SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website
Sydney	Sydney Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP/79 South Operational Area

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	40
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	21
Key Ecological Features (Marine):	1
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

[Diomedea epomophora](#)

Southern Royal Albatross [89221]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Fish

Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Current Scientific Name	Status	Type of Presence
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging	Likely to be present

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South OA 2km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	40
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	23
Key Ecological Features (Marine):	1
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

[Diomedea epomophora](#)

Southern Royal Albatross [89221]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Fish

Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Current Scientific Name	Status	Type of Presence
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		(Particular Manner)	
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		

Scientific Name	Behaviour	Presence
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South OA 3.59km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	40
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	24
Key Ecological Features (Marine):	1
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

[Diomedea epomophora](#)

Southern Royal Albatross [89221]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Fish

Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Current Scientific Name	Status	Type of Presence
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		

Scientific Name	Behaviour	Presence
Ardena pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South OA 12.6km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	41
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	29
Key Ecological Features (Marine):	1
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardenna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Fish

Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area

Current Scientific Name	Status	Type of Presence
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South OA 22.8km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	40

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	39
Key Ecological Features (Marine):	1
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
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[Neophoca cinerea](#)

Australian Sea-lion, Australian Sea Lion [22]

Endangered

Species or species habitat may occur within area

REPTILE

[Caretta caretta](#)

Loggerhead Turtle [1763]

Endangered

Species or species habitat likely to occur within area

[Chelonia mydas](#)

Green Turtle [1765]

Vulnerable

Species or species habitat may occur within area

[Dermochelys coriacea](#)

Leatherback Turtle, Leathery Turtle, Luth [1768]

Endangered

Species or species habitat likely to occur within area

SHARK

[Carcharodon carcharias](#)

White Shark, Great White Shark [64470]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

[Centrophorus uyato](#)

Little Gulper Shark [68446]

Conservation Dependent

Species or species habitat likely to occur within area

[Galeorhinus galeus](#)

School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]

Conservation Dependent

Species or species habitat may occur within area

Listed Migratory Species

[\[Resource Information \]](#)

Scientific Name

Threatened Category

Presence Text

Migratory Marine Birds

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat likely to occur within area

[Ardena carneipes](#)

Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]

Foraging, feeding or related behaviour likely to occur within area

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals [Resource Information]			
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardeanna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardeanna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South OA 20km Light EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	40

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	27
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	36
Key Ecological Features (Marine):	1
Biologically Important Areas:	18
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardena carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur

Scientific Name	Behaviour	Presence
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[Thalassarche chlororhynchos bassi](#)

Indian Yellow-nosed Albatross [85249]

Foraging

Known to occur

[Thalassarche melanophris](#)

Black-browed Albatross [66472]

Foraging

Known to occur

[Thalassarche melanophris impavida](#)

Campbell Albatross [82449]

Foraging

Known to occur

Sharks

[Carcharodon carcharias](#)

White Shark [64470]

Distribution

Likely to occur

[Carcharodon carcharias](#)

White Shark [64470]

Distribution

Known to occur

[Carcharodon carcharias](#)

White Shark [64470]

Distribution
(low density)

Likely to occur

[Carcharodon carcharias](#)

White Shark [64470]

Foraging

Known to occur

[Carcharodon carcharias](#)

White Shark [64470]

Known
distribution

Known to occur

Whales

[Balaenoptera musculus brevipinna](#)

Pygmy Blue Whale [81317]

Distribution

Known to occur

[Balaenoptera musculus brevipinna](#)

Pygmy Blue Whale [81317]

Foraging

Likely to be
present

[Balaenoptera musculus brevipinna](#)

Pygmy Blue Whale [81317]

Foraging
(annual high
use area)

Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 27-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South 49 km Flaring EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	94
Listed Migratory Species:	66

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	107
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	14
Regional Forest Agreements:	1
Nationally Important Wetlands:	2
EPBC Act Referrals:	69
Key Ecological Features (Marine):	2
Biologically Important Areas:	15
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
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Historic

Great Ocean Road and Scenic Environs	VIC	Listed place
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Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
INSECT		

Scientific Name	Threatened Category	Presence Text
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (southeastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardena carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area

Fish

Scientific Name	Threatened Category	Presence Text
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Current Scientific Name	Status	Type of Presence
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Bay of Islands Coastal Park	Conservation Park	VIC	
Cooriemungle	Reference Area	VIC	
Cooriemungle Creek F.R	Nature Conservation Reserve	VIC	
Curdie Vale N.C.R.	Natural Features Reserve	VIC	
Great Otway	National Park	VIC	
Lake Gilleard W.R	Natural Features Reserve	VIC	
Latrobe B.R.	Natural Features Reserve	VIC	
Merri	Marine Sanctuary	VIC	
Nullawarre F.R.	Nature Conservation Reserve	VIC	
Port Campbell	National Park	VIC	
Princetown W.R	Natural Features Reserve	VIC	
The Arches	Marine Sanctuary	VIC	
Timboon I1 B.R	Natural Features Reserve	VIC	
Twelve Apostles	Marine National Park	VIC	

Regional Forest Agreements

[[Resource Information](#)]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
West Victoria RFA	Victoria

Nationally Important Wetlands

[[Resource Information](#)]

Wetland Name	State
Lower Merri River Wetlands	VIC
Princetown Wetlands	VIC

EPBC Act Referrals [[Resource Information](#)]

Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
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Name	Region	
Bonney Coast Upwelling	South-east	
West Tasmania Canyons	South-east	
Biologically Important Areas [Resource Information]		
Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South MDO Mod EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	91
Listed Migratory Species:	55

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	92
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	3
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	10
Regional Forest Agreements:	2
Nationally Important Wetlands:	2
EPBC Act Referrals:	59
Key Ecological Features (Marine):	2
Biologically Important Areas:	26
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community may occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community may occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Species or species habitat may occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area

FROG

Scientific Name	Threatened Category	Presence Text
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (southeastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Roosting known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat likely to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands

[[Resource Information](#)]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Unknown	
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21583]	VIC

Listed Marine Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus		
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris as Puffinus tenuirostris		
Short-tailed Shearwater [82652]		Breeding known to occur within area
Bubulcus ibis as Ardea ibis		
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route likely to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	

Park Name	Zone & IUCN Categories
Zeehan	Multiple Use Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Christmas Island	Nature Reserve	TAS
Great Otway	National Park	VIC
New Year Island	Game Reserve	TAS
Parker River	Reference Area	VIC
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC
The Arches	Marine Sanctuary	VIC
Twelve Apostles	Marine National Park	VIC

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Lower Aire River Wetlands	VIC

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Key Ecological Features [[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis		
Antipodean Albatross [82269]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South MDO Low

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	4
Wetlands of International Importance (Ramsar)	6
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	13
Listed Threatened Species:	170
Listed Migratory Species:	83

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	49
Commonwealth Heritage Places:	8
Listed Marine Species:	134
Whales and Other Cetaceans:	32
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	6
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	179
Regional Forest Agreements:	4
Nationally Important Wetlands:	22
EPBC Act Referrals:	273
Key Ecological Features (Marine):	4
Biologically Important Areas:	39
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Gippsland lakes	Within 10km of Ramsar site
Glenelg estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community may occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Acanthiza pusilla magnirostris		
King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Species or species habitat may occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
FISH		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat may occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat likely to occur within area
INSECT		
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Koonoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
PLANT		
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268) Wingan Star-hair [85675]	Endangered	Species or species habitat likely to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat may occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area
Centrolepis pedderensis Pedder Centrolepis, Pedder Bristlewort [12647]	Endangered	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat may occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat may occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pseudocephalozia paludicola Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Rutidosia leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Carinascincus orocryptus Heath Cool-skink, Mountain Skink [90209]	Endangered	Species or species habitat may occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area
Tymanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardena carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Ardena tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC

Commonwealth Land Name	State
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20088]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC

Commonwealth Land Name	State
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC

Unknown

Commonwealth Land - [60111]	TAS
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21509]	VIC
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [22391]	VIC
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [21582]	VIC

Commonwealth Heritage Places

[[Resource Information](#)]

Name	State	Status
Historic		
Cape Sorell Lighthouse	TAS	Listed place
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Sorrento Post Office	VIC	Listed place

Name	State	Status
Swan Island Defence Precinct	VIC	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species	[Resource Information]	
Scientific Name	Threatened Category	Presence Text

Bird		
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Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats [[Resource Information](#)]

Name	Type of Presence
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat

Australian Marine Parks [[Resource Information](#)]

Park Name	Zone & IUCN Categories
Apollo	Multiple Use Zone (IUCN VI)
Beagle	Multiple Use Zone (IUCN VI)
East Gippsland	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Aireys Inlet B.R.	Natural Features Reserve	VIC
Albatross Island	Nature Reserve	TAS
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthur-Pieman	Conservation Area	TAS
Baawang	Reference Area	VIC
Badger Box Creek	Nature Reserve	TAS
Bald Hills B.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bass Pyramid	Nature Reserve	TAS
Bats Ridge W.R	Nature Conservation Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Bellarine I109 B.R.	Natural Features Reserve	VIC
Bellarine I110 B.R.	Natural Features Reserve	VIC
Black Pyramid Rock	Nature Reserve	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Calder River	Reference Area	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Sorell	Historic Site	TAS
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Counsel Hill	Conservation Area	TAS
Croajingolong	National Park	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Deen Maar	Indigenous Protected Area	VIC
Deep Lagoons	Conservation Area	TAS
Devils Tower	Nature Reserve	TAS
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Eagle Rock	Marine Sanctuary	VIC
East Gippsland Coastal streams	Natural Catchment Area	VIC
East Moncoeur Island	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Fingal B.R	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Four Mile Beach	Regional Reserve	TAS
French Island	National Park	VIC
Gentle Annie	Conservation Area	TAS
Goose Lagoon W.R	Natural Features Reserve	VIC
Great Otway	National Park	VIC

Protected Area Name	Reserve Type	State
Hogan Group	Conservation Area	TAS
Johanna Falls S.R.	Natural Features Reserve	VIC
Kentford Forest	Conservation Area	TAS
Kentford Forest	Nature Reserve	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Gilleard W.R	Natural Features Reserve	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lymwood	Conservation Covenant	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC

Protected Area Name	Reserve Type	State
Millwood Road	Conservation Covenant	TAS
Mornington Peninsula	National Park	VIC
Mount Heemskirk	Regional Reserve	TAS
Mount Vereker Creek	Natural Catchment Area	VIC
Muddy Lagoon	Nature Reserve	TAS
Mushroom Reef	Marine Sanctuary	VIC
Narrawong F.R.	Nature Conservation Reserve	VIC
New Year Island	Game Reserve	TAS
North East Islet	Nature Reserve	TAS
Ocean Beach	Conservation Area	TAS
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Pegarah	Private Nature Reserve	TAS
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Phillip Island Nature Park	Other	VIC
Pieman River	State Reserve	TAS
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Port Phillip Heads	Marine National Park	VIC
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rodondo Island	Nature Reserve	TAS
Sandpatch	Wilderness Zone	VIC
Sartoris Rd Nugara	Conservation Covenant	TAS
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Creek	Reference Area	VIC
Seal Rocks	State Reserve	TAS
Seal Rocks	Conservation Area	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS

Protected Area Name	Reserve Type	State
Southwest	Conservation Area	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Sugarloaf Rock	Conservation Area	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tambar	Conservation Covenant	TAS
Tarwin Lower F.R.	Nature Conservation Reserve	VIC
Tathams Lagoon	Conservation Area	TAS
The Arches	Marine Sanctuary	VIC
Tikkawoppa Plateau	Regional Reserve	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Trial Harbour	State Reserve	TAS
Twelve Apostles	Marine National Park	VIC
Unnamed P0176	Private Nature Reserve	VIC
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Waratah B.R	Natural Features Reserve	VIC
West Moncoeur Island	Nature Reserve	TAS
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Wilsons Promontory	National Park	VIC
Wilsons Promontory	Wilderness Zone	VIC
Wilsons Promontory	Marine National Park	VIC
Wilsons Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilsons Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilsons Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC
Wright Rock	Nature Reserve	TAS
Yambacoona	Conservation Covenant	TAS
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yanakie F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
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RFA Name	State
East Gippsland RFA	Victoria
Gippsland RFA	Victoria
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands	[Resource Information]
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Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Benedore River	VIC
Bungaree Lagoon	TAS
Corner Inlet	VIC
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lavinia Nature Reserve	TAS
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Mud Islands	VIC
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Shallow Inlet Marine & Coastal Park	VIC
Swan Bay & Swan Island	VIC
Tower Hill	VIC
Western Port	VIC

Wetland Name	State
Yambuk Wetlands	VIC

EPBC Act Referrals	[Resource Information]
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Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Farming Expansion, Macquarie Harbour, TAS	2012/6406		Assessment
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field	2022/09436		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
<u>Investigations</u>			
<u>Spinifex Offshore Surveys</u>	2022/09359		Completed
<u>Controlled action</u>			
<u>Alston-1 petroleum exploration well, permit VIC/P44</u>	2003/1315	Controlled Action	Post-Approval
<u>Bald Hills Wind Farm 80 Turbines</u>	2002/730	Controlled Action	Post-Approval
<u>Basalt Quarry Extension (Mountainview Quarry)</u>	2004/1329	Controlled Action	Completed
<u>Casino Gas Field Development</u>	2003/1295	Controlled Action	Post-Approval
<u>City Of Greater Geelong Mosquito Control Program 2021-2030, Vic</u>	2020/8782	Controlled Action	Further Information Request
<u>DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions</u>	2017/8038	Controlled Action	Completed
<u>Establishment of plantation for use of effluent water</u>	2003/1063	Controlled Action	Completed
<u>Geelong Salt Fields Urban Renewal Project</u>	2012/6630	Controlled Action	Assessment Approach
<u>Gippsland Regional Port Project</u>	2020/8667	Controlled Action	Assessment Approach
<u>Heemskirk Windfarm Development</u>	2002/678	Controlled Action	Completed
<u>Kentbruck Green Power Hub, Vic</u>	2019/8510	Controlled Action	Assessment Approach
<u>Lonsdale Golf Club Redevelopment</u>	2003/969	Controlled Action	Post-Approval
<u>Lorne Golf Course redevelopment</u>	2004/1513	Controlled Action	Post-Approval
<u>Mosquito Control</u>	2005/2132	Controlled Action	Post-Approval
<u>Otway Development</u>	2002/621	Controlled Action	Post-Approval
<u>Pacific Hydro (Portland) Wind Farm SW Victoria</u>	2000/18	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Estate, 251-319 Melaluka Rd	2007/3308	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Residential Subdivision and Stormwater Enhancements for land west of Ash Road	2012/6544	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL)	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Barwon River Parkland Initiative, Taits Point, Stages 1 and 2	2010/5437	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of a Dwelling	2011/6160	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Extension of Mountain View basalt quarry by 113 hectares (stage one)	2004/1591	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Geelong Bypass Sections 1 & 2	2005/2097	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Sparrovale Wetland stormwater management, Armstrong Creek and Charlemont, VIC	2018/8375	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wastewater Treatment System Upgrade	2004/1420	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
development of retirement village, Bellarine Lakes Golf Course, Bellarine Hwy	2006/3015	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness PT 2	2006/3044	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness WHA	2004/1846	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Holloman 2010 Vic/P60 3D Seismic Acquisition Survey Program	2009/5251	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Stati	2008/4156	Referral Decision	Completed

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Bonney Coast Upwelling	South-east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Seabirds		
Ardena grisea		
Sooty Shearwater [82651]	Foraging	Likely to occur
Ardena pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardena pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardena tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardena tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	
Gippsland	Gippsland Basin	BA website	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South LOWC Mod EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	4
Wetlands of International Importance (Ramsar)	6
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	16
Listed Threatened Species:	184
Listed Migratory Species:	85

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	71
Commonwealth Heritage Places:	7
Listed Marine Species:	138
Whales and Other Cetaceans:	32
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	7
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	242
Regional Forest Agreements:	5
Nationally Important Wetlands:	30
EPBC Act Referrals:	292
Key Ecological Features (Marine):	3
Biologically Important Areas:	40
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Gippsland lakes	Within Ramsar site
Glanelg estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
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Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community may occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community may occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

CRUSTACEAN

Scientific Name	Threatened Category	Presence Text
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat likely to occur within area
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat may occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Oreisplanus munionga larana Marrawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat likely to occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area

Scientific Name	Threatened Category	Presence Text
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
PLANT		
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat likely to occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268) Wingan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat likely to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider- orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat may occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat known to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat likely to occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat known to occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Deyeuxia ramosa Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat may occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum littorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Prostanthera galbraithiae Wellington Mintbush [64959]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis rubenachii Arthur River Greenhood [64536]	Endangered	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat may occur within area
Rutidosia leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area

SHARK

Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		

Scientific Name	Threatened Category	Presence Text
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardena carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Ardena tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20088]	VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC

Commonwealth Land Name	State
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC
Unknown	
Commonwealth Land - [60111]	TAS
Commonwealth Land - [22391]	VIC
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21497]	VIC
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21490]	VIC
Commonwealth Land - [21492]	VIC
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60112]	TAS

Commonwealth Land Name	State
Commonwealth Land - [60115]	TAS
Commonwealth Land - [21498]	VIC
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21489]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21582]	VIC
Commonwealth Land - [21583]	VIC

Commonwealth Heritage Places [[Resource Information](#)]

Name	State	Status
Historic		
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats [\[Resource Information \]](#)

Name	Type of Presence
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Apollo	Multiple Use Zone (IUCN VI)
Beagle	Multiple Use Zone (IUCN VI)
Boags	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Nelson	Special Purpose Zone (IUCN VI)

Park Name	Zone & IUCN Categories
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Agnes Falls S.R.	Natural Features Reserve	VIC
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Aireys Inlet B.R.	Natural Features Reserve	VIC
Albatross Island	Nature Reserve	TAS
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthur-Pieman	Conservation Area	TAS
Arthur River Rd Marrawah	Conservation Covenant	TAS
Arthurs Seat	State Park	VIC
Baawang	Reference Area	VIC
Badger Box Creek	Nature Reserve	TAS
Bald Hill N.C.R	Natural Features Reserve	VIC
Bald Hills B.R.	Natural Features Reserve	VIC
Bald Hills Creek W.R	Nature Conservation Reserve	VIC
Balnarring G95 B.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Barwon Bluff	Marine Sanctuary	VIC
Bass River SS.R.	Natural Features Reserve	VIC
Bats Ridge W.R	Nature Conservation Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Bellarine I110 B.R.	Natural Features Reserve	VIC
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Bennison F.F.R.	Nature Conservation Reserve	VIC
Beware Reef	Marine Sanctuary	VIC
Black Pyramid Rock	Nature Reserve	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Buckley N.C.R.	Natural Features Reserve	VIC
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Cape Conran Coastal Park	Conservation Park	VIC

Protected Area Name	Reserve Type	State
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corner Inlet	Marine National Park	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Crinoline Creek	Reference Area	VIC
Croajingolong	National Park	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS

Protected Area Name	Reserve Type	State
Curtis Island	Nature Reserve	TAS
Darriman H29 B.R	Natural Features Reserve	VIC
Deen Maar	Indigenous Protected Area	VIC
Deep Lagoons	Conservation Area	TAS
Devils Tower	Nature Reserve	TAS
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Doomburrin B.R	Natural Features Reserve	VIC
Drakes B.R.	Natural Features Reserve	VIC
Dromana B.R.	Natural Features Reserve	VIC
Drumdlemara H1 B.R	Natural Features Reserve	VIC
Drumdlemara H2 B.R	Natural Features Reserve	VIC
Drumdlemara H4 B.R	Natural Features Reserve	VIC
Drumdlemara H8 B.R	Natural Features Reserve	VIC
Eagle Rock	Marine Sanctuary	VIC
East Gippsland Coastal streams	Natural Catchment Area	VIC
East Moncoeur Island	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Entrance Point	Reference Area	VIC
Fingal B.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Franklin River SS.R.	Natural Features Reserve	VIC
French Island	National Park	VIC
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC
Gentle Annie	Conservation Area	TAS
Giffard H31 B.R	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Gorae B.R.	Natural Features Reserve	VIC
Great Otway	National Park	VIC
Hoddle Range F.R.	Nature Conservation Reserve	VIC
Hogan Group	Conservation Area	TAS
Jack Smith Lake W.R	Natural Features Reserve	VIC
Johanna Falls S.R.	Natural Features Reserve	VIC
Kangerong N.C.R	Natural Features Reserve	VIC
Kentford Forest	Nature Reserve	TAS
Kentford Forest	Conservation Area	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Kings Flat F.R	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Kings Run	Private Nature Reserve	TAS
Kings Run #2	Conservation Covenant	TAS
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Denison W.R	Natural Features Reserve	VIC
Lake Gilleard W.R	Natural Features Reserve	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Leongatha H3 B.R.	Natural Features Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lymwood	Conservation Covenant	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC
Merricks Creek B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Millwood Road	Conservation Covenant	TAS
Mimosa Rocks	National Park	NSW
Mornington Peninsula	National Park	VIC
Mount Richmond	National Park	VIC
Mount Vereker Creek	Natural Catchment Area	VIC
Muddy Lagoon	Nature Reserve	TAS
Mushroom Reef	Marine Sanctuary	VIC
Narrawong F.R.	Nature Conservation Reserve	VIC
New Year Island	Game Reserve	TAS
New Zealand Hill F.R.	Nature Conservation Reserve	VIC
Ninety Mile Beach	Marine National Park	VIC
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
North East Islet	Nature Reserve	TAS
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Pegarah	Private Nature Reserve	TAS
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Phillip Island Nature Park	Other	VIC
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC

Protected Area Name	Reserve Type	State
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Red Hill South B.R.	Natural Features Reserve	VIC
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rodondo Island	Nature Reserve	TAS
Rosebud B.R.	Natural Features Reserve	VIC
Salt Lagoon, St Leonards W.R	Nature Conservation Reserve	VIC
Sandpatch	Wilderness Zone	VIC
Sartoris Rd Nugara	Conservation Covenant	TAS
Screw Creek N.C.R.	Natural Features Reserve	VIC
Sea Elephant	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	Conservation Area	TAS
Seal Rocks	State Reserve	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Slaves Bay	Conservation Area	TAS
Snowy River	Heritage River	VIC
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Sugarloaf Rock	Conservation Area	TAS
Sundown Point	State Reserve	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tambar	Conservation Covenant	TAS
Tarra Tarra B.R	Natural Features Reserve	VIC
Tarwin Lower F.R.	Nature Conservation Reserve	VIC
Tarwin South B.R	Natural Features Reserve	VIC
Tathams Lagoon	Conservation Area	TAS
The Arches	Marine Sanctuary	VIC
Tin Mine Rd Loorana	Conservation Covenant	TAS

Protected Area Name	Reserve Type	State
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Twelve Apostles	Marine National Park	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed P0155	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Waratah B.R	Natural Features Reserve	VIC
Warra Creek	Regional Reserve	TAS
Warrigal Creek SS.R.	Natural Features Reserve	VIC
Welshpool H17 B.R	Natural Features Reserve	VIC
West Moncoeur Island	Nature Reserve	TAS
West Point	State Reserve	TAS
Whipstick Gully N.F.R.	Natural Features Reserve	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Marine National Park	VIC

Protected Area Name	Reserve Type	State
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilson's Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilson's Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonga Wonga South B.R.	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi G242 B.R.	Natural Features Reserve	VIC
Wonthaggi G243 B.R.	Natural Features Reserve	VIC
Wonthaggi G244 B.R.	Natural Features Reserve	VIC
Wonthaggi G245 B.R.	Natural Features Reserve	VIC
Wonthaggi G246 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R.	Natural Features Reserve	VIC
Woodside H26 B.R.	Natural Features Reserve	VIC
Woodside H27 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Woodside H28 B.R	Natural Features Reserve	VIC
Yambacoona	Conservation Covenant	TAS
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC
Yanakie F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland RFA	Victoria
Eden RFA	New South Wales
Gippsland RFA	Victoria
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands

[\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Bald Hills State Wildlife Reserve	VIC
Benedore River	VIC
Bungaree Lagoon	TAS
Corner Inlet	VIC
Jack Smith Lake State Game Reserve	VIC
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lavinia Nature Reserve	TAS

Wetland Name	State
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Lower Snowy River Wetlands System	VIC
Mud Islands	VIC
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Shallow Inlet Marine & Coastal Park	VIC
Snowy River	VIC
Swan Bay & Swan Island	VIC
Sydenham Inlet Wetlands	VIC
Tamboon Inlet Wetlands	VIC
Thurra River	VIC
Tower Hill	VIC
Unnamed Wetland	TAS
Western Port	VIC
Yambuk Wetlands	VIC

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision

Title of referral	Reference	Referral Outcome	Assessment Status
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Gelliondale Wind Farm Project	2023/09577		Assessment
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
South East Australia Carbon Capture and Storage Project, Onshore and State waters	2023/09731		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Boundary Road Quarry extension, Dromana, Vic	2018/8221	Controlled Action	Assessment Approach
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Maintenance Dredging of Toora Boat Ramp Channel	2008/4376	Controlled Action	Completed
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Tarkine Forest Drive Road Upgrade	2011/6210	Controlled Action	Post-Approval
The Tarkine Road Project	2009/5169	Controlled Action	Completed
Thomson River Mercury Recovery Project	2010/5734	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Windfarm	2003/1109	Controlled Action	Completed
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Acquisition of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
development of retirement resort	2004/1828	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Oceanlinx South Australia 1mW Greenwave Project	2012/6528	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Port Welshpool Harbour Dredging	2007/3521	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Development, 409 The Esplanade, St Leonards	2006/2950	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
To undertake maintenance dredging of the Toora Boat Ramp Channel, VIC	2014/7225	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Upgrade of existing access track	2011/5933	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey, EPP33	2004/1794	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
2D Siesmic Marine Survey	2008/4074	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Bass Coast, South Gippsland and Cardinia Shires, Gas Pipeline and Lang Lang Offtake and City Gate St	2006/2867	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Collection of cast bull kelp	2002/813	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program	2009/4953	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey in Petroleum Permit Area EPP27	2002/648	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Soil and Organic Recycling Facility	2005/2216	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
<u>Not controlled action (particular manner)</u>			
		Manner)	
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Upgrade of Arthur River Road	2003/930	Not Controlled Action (Particular Manner)	Post-Approval
Vegetation clearance and residential subdivision near Mt Gambier	2004/1370	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
2D Seismic Survey	2008/3978	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Land clearing for stock grazing	2005/2176	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm with 80 Turbines for Production of Electricity	2002/699	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Stati	2008/4156	Referral Decision	Completed

Key Ecological Features [[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [[Resource Information](#)]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Seabirds		
Ardena grisea		
Sooty Shearwater [82651]	Foraging	Likely to occur
Ardena pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardena pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardena tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardena tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Likely to occur

Scientific Name	Behaviour	Presence
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Seals		
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Known to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur

Bioregional Assessments		[Resource Information]
SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 South LOWC Low EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	5
Wetlands of International Importance (Ramsar)	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	5
Listed Threatened Ecological Communities:	24
Listed Threatened Species:	233
Listed Migratory Species:	92

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	120
Commonwealth Heritage Places:	19
Listed Marine Species:	149
Whales and Other Cetaceans:	33
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	2
Australian Marine Parks:	16
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	392
Regional Forest Agreements:	6
Nationally Important Wetlands:	66
EPBC Act Referrals:	435
Key Ecological Features (Marine):	7
Biologically Important Areas:	57
Bioregional Assessments:	2
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status
Tasmanian Wilderness	TAS	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Natural

Tasmanian Wilderness	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Edithvale-seaford wetlands	Within 10km of Ramsar site
Gippsland lakes	Within Ramsar site
Glenelg estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Piccaninnie ponds karst wetlands	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities

[[Resource Information](#)]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area
Araluen Scarp Grassy Forest	Endangered	Community may occur within area
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Gippsland Red Gum (<i>Eucalyptus tereticornis</i> subsp. <i>mediana</i>) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Foraging, feeding or related behaviour known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat known to occur within area
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat known to occur within area
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Mordacia praecox Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Nannoperca variegata Variegated Pygmy Perch, Ewens Pygmy Perch, Golden Pygmy Perch [26178]	Vulnerable	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
Thymichthys politus Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Oreisplanus munionga larana Marrawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat likely to occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat known to occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
OTHER		
Dendronephthya australis Cauliflower Soft Coral [90325]	Endangered	Species or species habitat likely to occur within area
Hyridella glenelgensis Glenelg Freshwater Mussel [82953]	Critically Endangered	Species or species habitat may occur within area
Megascolides australis Giant Gippsland Earthworm [64420]	Vulnerable	Species or species habitat may occur within area
PLANT		
Acacia caerulescens Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia constablei Narrabarba Wattle [10798]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Acacia georgensis Bega Wattle [9848]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Astrotricha crassifolia Thick-leaf Star-hair [10352]	Vulnerable	Species or species habitat may occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268) Wingan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Banksia vincentia [88276]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia caudata Tailed Spider-orchid [17067]	Vulnerable	Species or species habitat may occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat known to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat known to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat known to occur within area
Caladenia pumila Dwarf Spider-orchid [4155]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia richardsiorum Little Dip Spider-orchid [55018]	Endangered	Species or species habitat likely to occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Centrolepis pedderensis Pedder Centrolepis, Pedder Bristlewort [12647]	Endangered	Species or species habitat likely to occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat known to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat known to occur within area
Correa lawrenceana var. genoensis Genoa River Correa [66626]	Endangered	Species or species habitat may occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat known to occur within area
Corunastylis rhyolitica listed as Genoplesium rhyoliticum Pambula Midge-orchid, Rhyolite Midge Orchid [78697]	Endangered	Species or species habitat likely to occur within area
Corunastylis vernalis listed as Genoplesium vernale East Lynne Midge-orchid [78699]	Vulnerable	Species or species habitat known to occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat may occur within area
Deyeuxia ramosa Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area
Diuris basaltica Small Golden Moths Orchid, Early Golden Moths [64654]	Endangered	Species or species habitat may occur within area
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus stenostoma Jillaga Ash [3976]	Endangered	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat known to occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Leionema ralstonii [64926]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat likely to occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat known to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Pomaderris halmaturina subsp. halmaturina Kangaroo Island Pomaderris [21964]	Vulnerable	Species or species habitat known to occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum affine Jervis Bay Leek Orchid, Culburra Leek- orchid, Kinghorn Point Leek-orchid [2210]	Endangered	Species or species habitat known to occur within area
Prasophyllum atratum Three Hummock Leek-orchid [82677]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat may occur within area
Prostanthera galbraithiae Wellington Mintbush [64959]	Vulnerable	Species or species habitat known to occur within area
Pseudocephalozia paludicola Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Pterostylis rubenachii Arthur River Greenhood [64536]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat likely to occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat likely to occur within area
Taraxacum cygnorum Coast Dandelion, Native Dandelion [2508]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat known to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Westringia davidii [19079]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
Zieria tuberculata Warty Zieria [56736]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Carinascincus orocryptus Heath Cool-skink, Mountain Skink [90209]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Endangered	Species or species habitat may occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Tymanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Zearaja maugeana Maugean Skate, Port Davey Skate [83504]	Endangered	Species or species habitat known to occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardeanna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardeanna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardeanna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardeanna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Communications, Information Technology and the Arts - Australian Postal Corporation Commonwealth Land - Australian Postal Commission [12052]	NSW

Communications, Information Technology and the Arts - Telstra Corporation Limited Commonwealth Land - Australian Telecommunications Commission [12265]	NSW
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Commonwealth Land - Australian Telecommunications Commission [12053]NSW

Commonwealth Land - Australian Telecommunications Commission [12050]NSW

Commonwealth Land - Australian Telecommunications Commission [15535]NSW

Commonwealth Land - Australian Telecommunications Commission [15461]NSW

Commonwealth Land - Australian Telecommunications Commission [15430]NSW

Commonwealth Land - Australian Telecommunications Commission [16089]NSW

Commonwealth Land - Australian Telecommunications Commission [15611]NSW

Commonwealth Land - Australian Telecommunications Commission [12014]NSW

Commonwealth Land - Telstra Corporation Limited [12051] NSW

Commonwealth Land Name	State
Commonwealth Land - Telstra Corporation Limited [15888]	NSW
Defence	
Defence - AIRTC GEELONG [21354]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - DUTSON BOMBING RANGE [20062]	VIC
Defence - DUTSON BOMBING RANGE [20061]	VIC
Defence - DUTSON BOMBING RANGE [20037]	VIC
Defence - DUTSON BOMBING RANGE [20036]	VIC
Defence - DUTSON BOMBING RANGE [20038]	VIC
Defence - DUTSON BOMBING RANGE [20035]	VIC
Defence - DUTSON BOMBING RANGE [20033]	VIC
Defence - DUTSON BOMBING RANGE [20034]	VIC
Defence - HMAS CERBERUS [20098]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20084]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20080]	VIC
Defence - HMAS CERBERUS [20083]	VIC
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20088]	VIC
Defence - HMAS CERBERUS [20085]	VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20082]	VIC
Defence - Myers Street (opp. Geelong Hospital) [20450]	VIC
Defence - POINT WILSON EXPLOSIVES AREA [21441]	VIC
Defence - POINT WILSON EXPLOSIVES AREA [21442]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC

Commonwealth Land Name	State
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC
Environment and Heritage	
Commonwealth Land - Booderee National Park [91004]	JBT
Commonwealth Land - Booderee National Park [91002]	JBT
Commonwealth Land - Booderee National Park [91005]	JBT
Commonwealth Land - Booderee National Park [91001]	JBT
Commonwealth Land - Booderee National Park [91003]	JBT
Transport and Regional Services - Australian Maritime Safety Authority	
Commonwealth Land - Australian Maritime Safety Authority [41288]	SA
Commonwealth Land - Australian Maritime Safety Authority [41215]	SA
Commonwealth Land - Australian Maritime Safety Authority [41289]	SA

Commonwealth Land Name	State
Unknown	
Commonwealth Land - [22391]	VIC
Commonwealth Land - [22390]	VIC
Commonwealth Land - [12045]	NSW
Commonwealth Land - [12046]	NSW
Commonwealth Land - [12047]	NSW
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21508]	VIC
Commonwealth Land - [21507]	VIC
Commonwealth Land - [60116]	TAS
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21496]	VIC
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21490]	VIC
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21498]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [21497]	VIC
Commonwealth Land - [21590]	VIC
Commonwealth Land - [21591]	VIC
Commonwealth Land - [21489]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21487]	VIC
Commonwealth Land - [60346]	TAS

Commonwealth Land Name	State
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21582]	VIC
Commonwealth Land - [21589]	VIC
Commonwealth Land - [60111]	TAS

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic		
Cape Northumberland Lighthouse	SA	Listed place
Cape Sorell Lighthouse	TAS	Listed place
Cape St George Lighthouse Ruins & Curtilage	ACT	Listed place
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Gabo Island Lighthouse	VIC	Listed place
HMAS Cerberus Central Area Group	VIC	Listed place
Jervis Bay Botanic Gardens	ACT	Listed place
Montague Island Lighthouse	NSW	Listed place
Royal Australian Naval College	ACT	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Table Cape Lighthouse	TAS	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Indigenous		
Jervis Bay Territory	ACT	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Point Wilson Defence Natural Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place
Tasmanian Seamounts Area	EXT	Listed place

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat known to occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Breeding likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat likely to occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
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[Neophoca cinerea](#)

Australian Sea-lion, Australian Sea Lion [22]

Endangered

Species or species habitat known to occur within area

Reptile

[Caretta caretta](#)

Loggerhead Turtle [1763]

Endangered

Foraging, feeding or related behaviour known to occur within area

[Chelonia mydas](#)

Green Turtle [1765]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

[Dermochelys coriacea](#)

Leatherback Turtle, Leathery Turtle, Luth [1768]

Endangered

Foraging, feeding or related behaviour known to occur within area

[Eretmochelys imbricata](#)

Hawksbill Turtle [1766]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

[Natator depressus](#)

Flatback Turtle [59257]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name

Status

Type of Presence

Mammal

[Balaenoptera acutorostrata](#)

Minke Whale [33]

Species or species habitat may occur within area

[Balaenoptera bonaerensis](#)

Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]

Species or species habitat likely to occur within area

[Balaenoptera borealis](#)

Sei Whale [34]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Ginkgo-toothed Beaked Whale, Ginkgo-toothed Whale, Ginkgo Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats [\[Resource Information \]](#)

Name	Type of Presence
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat

Commonwealth Reserves Terrestrial [\[Resource Information \]](#)

Name	State	Type
Booderee	JBT	National Park (Commonwealth)
Booderee	JBT	Botanic Gardens (Commonwealth)

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
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Park Name	Zone & IUCN Categories
Huon	Habitat Protection Zone (IUCN IV)
Flinders	Marine National Park Zone (IUCN II)
Tasman Fracture	Marine National Park Zone (IUCN II)
Apollo	Multiple Use Zone (IUCN VI)
Beagle	Multiple Use Zone (IUCN VI)
Boags	Multiple Use Zone (IUCN VI)
East Gippsland	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Huon	Multiple Use Zone (IUCN VI)
Murray	Multiple Use Zone (IUCN VI)
Tasman Fracture	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Murray	Special Purpose Zone (IUCN VI)
Nelson	Special Purpose Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)
Jervis	Special Purpose Zone (Trawl) (IUCN VI)

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Agnes Falls S.R.	Natural Features Reserve	VIC	
Aire River	Heritage River	VIC	
Aire River W.R.	Natural Features Reserve	VIC	
Aireys Inlet B.R.	Natural Features Reserve	VIC	

Protected Area Name	Reserve Type	State
Albatross Island	Nature Reserve	TAS
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthur-Pieman	Conservation Area	TAS
Arthur River Rd Marrawah	Conservation Covenant	TAS
Arthurs Seat	State Park	VIC
Baawang	Reference Area	VIC
Badger Box Creek	Nature Reserve	TAS
Badger River	Regional Reserve	TAS
Balcombe Creek B.R.	Natural Features Reserve	VIC
Bald Hill N.C.R	Natural Features Reserve	VIC
Bald Hills B.R.	Natural Features Reserve	VIC
Balnarring G95 B.R.	Natural Features Reserve	VIC
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bass Pyramid	Nature Reserve	TAS
Bass River SS.R.	Natural Features Reserve	VIC
Batemans	Marine Park	NSW
Bats Ridge W.R	Nature Conservation Reserve	VIC
Baxter Island G.L.R.	Natural Features Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Bellarine I109 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Bellarine I110 B.R.	Natural Features Reserve	VIC
Bell Bird Creek	Nature Reserve	NSW
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Ben Boyd	National Park	NSW
Benedore River	Reference Area	VIC
Bennison F.F.R.	Nature Conservation Reserve	VIC
Bermagabee	Nature Reserve	NSW
Bermagui	Flora Reserve	NSW
Beware Reef	Marine Sanctuary	VIC
Biamanga	National Park	NSW
Bird Island	Game Reserve	TAS
Bittern B.R.	Natural Features Reserve	VIC
Black Pyramid Rock	Nature Reserve	TAS
Blond Bay G.L.R.	Natural Features Reserve	VIC
Blond Bay W.R.	Natural Features Reserve	VIC
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Bournda	National Park	NSW
Bournda	Nature Reserve	NSW
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Brick Islands	Conservation Area	TAS
Brodribb River F.F.R	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Broulee Island	Nature Reserve	NSW
Buckley N.C.R.	Natural Features Reserve	VIC
Bucks Lake	Game Reserve	SA
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Canunda	National Park	SA
Cape Conran Coastal Park	Conservation Park	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Sorell	Historic Site	TAS
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS
Carpenter Rocks	Conservation Park	SA
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Clyde River	National Park	NSW
Colliers Forest Reserve	Conservation Covenant	TAS

Protected Area Name	Reserve Type	State
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corinella Cemetery B.R.	Natural Features Reserve	VIC
Corner Inlet	Marine National Park	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Craggy Island	Conservation Area	TAS
Crib Point G228 B.R.	Natural Features Reserve	VIC
Crib Point G229 B.R.	Natural Features Reserve	VIC
Croajingolong	National Park	VIC
Cullendulla Creek	Nature Reserve	NSW
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Darriman H29 B.R	Natural Features Reserve	VIC
Deen Maar	Indigenous Protected Area	VIC
Deep Lagoons	Conservation Area	TAS
Devilbend N.F.R.	Natural Features Reserve	VIC
Devils Tower	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Dingley Dell	Conservation Park	SA
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Double Creek	Natural Catchment Area	VIC
Douglas Point	Conservation Park	SA
Drakes B.R.	Natural Features Reserve	VIC
Dromana B.R.	Natural Features Reserve	VIC
Drumdlemara H1 B.R	Natural Features Reserve	VIC
Drumdlemara H2 B.R	Natural Features Reserve	VIC
Drumdlemara H4 B.R	Natural Features Reserve	VIC
Dry Creek	Forest Reserve	SA
Eagle Rock	Marine Sanctuary	VIC
Eagles Claw	Nature Reserve	NSW
East Gippsland Coastal streams	Natural Catchment Area	VIC
East Moncoeur Island	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Entrance Point	Reference Area	VIC
Eurobodalla	National Park	NSW
Ewens Ponds	Conservation Park	SA
Ewing Morass W.R	Natural Features Reserve	VIC
Fingal B.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
First and Second Islands F.R.	Nature Conservation Reserve	VIC
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Fossil Beach G.R.	Natural Features Reserve	VIC
Four Mile Beach	Regional Reserve	TAS
Franklin River SS.R.	Natural Features Reserve	VIC
Fraser Island G.L.R.	Natural Features Reserve	VIC
French Island	National Park	VIC
French Island	Marine National Park	VIC
French Island (east)	Reference Area	VIC
French Island (north)	Reference Area	VIC
French Island G230 B.R	Natural Features Reserve	VIC
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC
Gentle Annie	Conservation Area	TAS
Giffard H31 B.R	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Glenelg River	Heritage River	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Gorae B.R.	Natural Features Reserve	VIC
Grantville N.C.R	Natural Features Reserve	VIC
Great Otway	National Park	VIC

Protected Area Name	Reserve Type	State
Gulaga	National Park	NSW
Harbour Islets	Conservation Area	TAS
Harcus Island	Conservation Area	TAS
Harcus River Rd West Montagu	Conservation Covenant	TAS
Harcus River Road #4	Conservation Covenant	TAS
Harcus River Road Marrawah	Conservation Covenant	TAS
Hedditch Hill S.R.	Natural Features Reserve	VIC
Henderson Islets	Conservation Area	TAS
Hoddle Range F.R.	Nature Conservation Reserve	VIC
Hogan Group	Conservation Area	TAS
Hopkins Falls S.R.	Natural Features Reserve	VIC
Hunter Island	Conservation Area	TAS
Illawong	Nature Reserve	NSW
Jack Smith Lake W.R	Natural Features Reserve	VIC
Jervis Bay	National Park	NSW
Jervis Bay	Marine Park	NSW
Johanna Falls S.R.	Natural Features Reserve	VIC
Johnstones Creek F.R	Nature Conservation Reserve	VIC
Kangaroo Island	Conservation Area	TAS
Kangerong N.C.R	Natural Features Reserve	VIC
Kentbruck H14 B.R	Natural Features Reserve	VIC
Kentbruck H50 B.R.	Natural Features Reserve	VIC
Kentford Forest	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Kentford Forest	Nature Reserve	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Kings Run	Private Nature Reserve	TAS
Kings Run #2	Conservation Covenant	TAS
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Coleman W.R	Natural Features Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Corringale W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Denison W.R	Natural Features Reserve	VIC
Lake Gillear W.R	Natural Features Reserve	VIC
Lake Robe	Game Reserve	SA
Lake Tyers S.P.	State Park	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Leongatha H3 B.R.	Natural Features Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Little Dip	Conservation Park	SA
Little Trefoil	Conservation Area	TAS
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lower Glenelg	National Park	VIC
Lower Glenelg River	Conservation Park	SA
Lower South East	Marine Park	SA
Lymwood	Conservation Covenant	TAS
Macquarie Harbour	Historic Site	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Mallacoota B.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC
Merricks Creek B.R.	Natural Features Reserve	VIC
Metung B.R.	Natural Features Reserve	VIC
Millwood Road	Conservation Covenant	TAS
Mimosa Rocks	National Park	NSW
Montague Island	Nature Reserve	NSW
Morley Swamp G.L.R.	Natural Features Reserve	VIC
Mornington Peninsula	National Park	VIC
Mortimers Paddock B.R.	Natural Features Reserve	VIC
Mount Dundas	Regional Reserve	TAS
Mount Heemskirk	Regional Reserve	TAS
Mount Martha N.C.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Mount Richmond	National Park	VIC
Mount Vereker Creek	Natural Catchment Area	VIC
Mouzie B.R	Natural Features Reserve	VIC
Mouzie N.F.R	Natural Features Reserve	VIC
Muddy Lagoon	Nature Reserve	TAS
Mumbulla	Flora Reserve	NSW
Murkay Islets	Conservation Area	TAS
Murrah	Flora Reserve	NSW
Murramarang	National Park	NSW
Mushroom Reef	Marine Sanctuary	VIC
Nadgee	Nature Reserve	NSW
Nares Rocks	Conservation Area	TAS
Narrawong F.R.	Nature Conservation Reserve	VIC
Nelson SS.R.	Natural Features Reserve	VIC
Nene Valley	Conservation Park	SA
New Year Island	Game Reserve	TAS
New Zealand Hill F.R.	Nature Conservation Reserve	VIC
Ninety Mile Beach	Marine National Park	VIC
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
North East Islet	Nature Reserve	TAS
North Western Port N.C.R.	Natural Features Reserve	VIC
Nungurner B.R.	Natural Features Reserve	VIC
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Ocean Beach	Conservation Area	TAS
Olivers Creek B.R.	Natural Features Reserve	VIC
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Pegarah	Private Nature Reserve	TAS
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Penguin Islet	Nature Reserve	TAS
Petrel Islands	Game Reserve	TAS
Phillip Island Nature Park	Other	VIC
Piccaninnie Ponds	Conservation Park	SA
Pieman River	State Reserve	TAS
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Portarlington (Point Richard) F.F.R.	Nature Conservation Reserve	VIC
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Princetown W.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Queenscliff N.F.R	Natural Features Reserve	VIC
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Raymond Island G.L.R.	Natural Features Reserve	VIC
Rebecca Creek	Conservation Area	TAS
Red Hill South B.R.	Natural Features Reserve	VIC
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rigby Island G.L.R.	Natural Features Reserve	VIC
Rodondo Island	Nature Reserve	TAS
Rosebud B.R.	Natural Features Reserve	VIC
Salt Lagoon, St Leonards W.R	Nature Conservation Reserve	VIC
Salt Lake - Backwater Morass G.L.R.	Natural Features Reserve	VIC
Sandpatch	Wilderness Zone	VIC
Sartoris Rd Nugara	Conservation Covenant	TAS
Screw Creek N.C.R.	Natural Features Reserve	VIC
Seacrow Islet	Conservation Area	TAS
Sea Elephant	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	State Reserve	TAS
Seal Rocks	Conservation Area	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Shell Islets	Conservation Area	TAS
Sister Islands	Conservation Area	TAS
Slaughterhouse Creek G.L.R.	Natural Features Reserve	VIC
Slaves Bay	Conservation Area	TAS
Snowy River	Heritage River	VIC
South East Forest	National Park	NSW
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Southwest	Conservation Area	TAS
Southwest	National Park	TAS
Stack Island	Game Reserve	TAS
Steel Bay - Newland Backwater G.L.R.	Natural Features Reserve	VIC
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Strahan Customs House	Historic Site	TAS
Sugarloaf Rock	Conservation Area	TAS
Sundown Point	State Reserve	TAS

Protected Area Name	Reserve Type	State
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Swan Reach Bay G.L.R.	Natural Features Reserve	VIC
Table Cape	State Reserve	TAS
Table Cape	Conservation Area	TAS
Tambar	Conservation Covenant	TAS
Tambo Delta - Metung G.L.R.	Natural Features Reserve	VIC
Tanja	Flora Reserve	NSW
Tarra Tarra B.R	Natural Features Reserve	VIC
Tarwin Lower F.R.	Nature Conservation Reserve	VIC
Tathams Lagoon	Conservation Area	TAS
Teepookana	Regional Reserve	TAS
Temma	Conservation Covenant	TAS
The Arches	Marine Sanctuary	VIC
The Doughboys	Nature Reserve	TAS
The Lakes	National Park	VIC
The Spit W.R.	Nature Conservation Reserve	VIC
Three Hummock Island	State Reserve	TAS
Tikkawoppa Plateau	Regional Reserve	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Tollgate Islands	Nature Reserve	NSW
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Trial Harbour	State Reserve	TAS
Tully River	Conservation Area	TAS
Twelve Apostles	Marine National Park	VIC
Tyabb B.R.	Natural Features Reserve	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed (No.HA1038)	Heritage Agreement	SA
Unnamed (No.HA108)	Heritage Agreement	SA
Unnamed (No.HA1166)	Heritage Agreement	SA
Unnamed (No.HA1180)	Heritage Agreement	SA
Unnamed (No.HA1404)	Heritage Agreement	SA
Unnamed (No.HA1457)	Heritage Agreement	SA
Unnamed (No.HA1560)	Heritage Agreement	SA
Unnamed (No.HA1626)	Heritage Agreement	SA
Unnamed (No.HA177)	Heritage Agreement	SA
Unnamed (No.HA26)	Heritage Agreement	SA
Unnamed (No.HA354)	Heritage Agreement	SA
Unnamed (No.HA42)	Heritage Agreement	SA
Unnamed (No.HA497)	Heritage Agreement	SA
Unnamed C0293	Private Nature Reserve	VIC
Unnamed P0155	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Upper South East	Marine Park	SA
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Wallaby Islands	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Waratah B.R	Natural Features Reserve	VIC
Warneet Balaka St B.R.	Natural Features Reserve	VIC
Warneet Iluka St B.R.	Natural Features Reserve	VIC
Warneet N.F.R.	Natural Features Reserve	VIC
Warra Creek	Regional Reserve	TAS
Warrengine Creek SS.R.	Natural Features Reserve	VIC
Wattle Point G.L.R.	Natural Features Reserve	VIC
Welcome River	State Reserve	TAS
Welshpool H17 B.R	Natural Features Reserve	VIC
West Coast Range	Regional Reserve	TAS
West Moncoeur Island	Nature Reserve	TAS
West Point	State Reserve	TAS
Whipstick Gully N.F.R.	Natural Features Reserve	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
William Hunter F.R	Nature Conservation Reserve	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Marine National Park	VIC
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilson's Promontory Marine Park	National Parks Act Schedule 4 park or	VIC

Protected Area Name	Reserve Type	State
	reserve	
Wilsons Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonga Wonga South B.R	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC
Woodside H26 B.R.	Natural Features Reserve	VIC
Woodside H27 B.R	Natural Features Reserve	VIC
Woodside H28 B.R	Natural Features Reserve	VIC
Wright Rock	Nature Reserve	TAS
Yambacoona	Conservation Covenant	TAS
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC
Yanakie F.R	Nature Conservation Reserve	VIC
Yaringa	Marine National Park	VIC

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland RFA	Victoria
Eden RFA	New South Wales
Gippsland RFA	Victoria
Southern RFA	New South Wales
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands

[\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Benedore River	VIC
Bondi Lake	NSW
Bungaree Lagoon	TAS
Clyde River Estuary	NSW
Coila Creek Delta	NSW
Corner Inlet	VIC
Cullendulla Creek and Embayment	NSW
Ewens Ponds	SA
Ewing's Marsh (Morass)	VIC
Glenelg Estuary	VIC
Glenelg River	VIC
Jack Smith Lake State Game Reserve	VIC
Jervis Bay	NSW
Jervis Bay Sea Cliffs	NSW

Wetland Name	State
Lake Ashwood	TAS
Lake Bantick	TAS
Lake Bunga	VIC
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lake Garcia	TAS
Lake King Wetlands	VIC
Lake Tyers	VIC
Lake Victoria Wetlands	VIC
Lake Wellington Wetlands	VIC
Lavinia Nature Reserve	TAS
Long Swamp	VIC
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Lower Snowy River Wetlands System	VIC
Mallacoota Inlet Wetlands	VIC
Merimbula Lake	NSW
Moruya River Estuary Saltmarshes	NSW
Mud Islands	VIC
Nadgee Lake and tributary wetlands	NSW
Nargal Lake	NSW
Nelson Lagoon	NSW
Pambula Estuarine Wetlands	NSW
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS

Wetland Name	State
Piccaninnie Ponds	SA
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Russells Swamp	VIC
Shallow Inlet Marine & Coastal Park	VIC
Snowy River	VIC
South East Coastal Salt Lakes	SA
St Georges Basin	NSW
Swan Bay & Swan Island	VIC
Sydenham Inlet Wetlands	VIC
Tamboon Inlet Wetlands	VIC
Tambo River (Lower Reaches) East Swamps	VIC
Thurra River	VIC
Tower Hill	VIC
Tuross River Estuary	NSW
Twofold Bay	NSW
Unnamed Wetland	TAS
Waldrons Swamp	NSW
Wallaga Lake	NSW
Wallagoot Lagoon (Wallagoot Lake)	NSW
Werribee-Avalon Area	VIC
Western Port	VIC
Yambuk Wetlands	VIC

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
Armstrong Creek Aquatic Venue and Multi-sport Community Facility	2023/09553		Completed
Australian Centre for Disease Preparedness Part life Refit	2023/09497		Completed
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Bermagui Golf Club Proposed Subdivision (Stages 3-8)	2022/09242		Post-Approval
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Broulee Beach Estate residential development subdivision	2023/09551		Completed
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Creamery Road PSP Area Geelong West Property Development	2021/8939		Assessment
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Eurobodalla Regional Hospital	2023/09506		Completed
Geelong Hydrogen Hub	2022/09288		Referral Decision
Gelliondale Wind Farm Project	2023/09577		Assessment
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Farming Expansion, Macquarie Harbour, TAS	2012/6406		Assessment
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Nora Creina integrated golf course and tourism development, SA	2014/7249		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Proposed residential subdivision	2023/09632		Completed
Residential Development, Groves Road	2022/09357		Post-Approval
Robbins Island Renewable Energy Park, Robbins Island, Tasmania	2017/8096		Approval
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
South East Australia Carbon Capture and Storage Project, Onshore and State waters	2023/09731		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Victorian Renewable Energy Terminal	2023/09609		Referral Decision
Vopak Victoria Energy Terminal	2023/09507		Assessment
Controlled action			
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Basalt Quarry Extension (Mountainview Quarry)	2004/1329	Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Boundary Road Quarry extension, Dromana, Vic	2018/8221	Controlled Action	Assessment Approach
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Construction of a factory for the production of ACV's	2007/3842	Controlled Action	Completed
Crib Point to Pakenham Gas Pipeline, Vic	2018/8297	Controlled Action	Completed
Dairy Farm expansion on the Woolnorth property	2013/6710	Controlled Action	Completed
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Extension of Mountain View basalt quarry by 490 hectares (Stage 2)	2004/1590	Controlled Action	Post-Approval
Gas Import Facility, Crib Point, Vic	2018/8298	Controlled Action	Completed
Geelong Salt Fields Urban Renewal Project	2012/6630	Controlled Action	Assessment Approach
Gippsland Lakes Mosquito Control Aerial /Hovercraft Spraying	2001/491	Controlled Action	Completed
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Glenelg Dolomite Quarry	2017/8021	Controlled Action	Post-Approval
Golden Beach Gas Project	2019/8513	Controlled Action	Post-Approval
Green Point Wind Farm	2001/529	Controlled Action	Post-Approval
Heemskirk Windfarm Development	2002/678	Controlled Action	Completed
Installation of replacement crude-condensate pipeline, Vic	2014/7202	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Maintenance Dredging of Toora Boat Ramp Channel	2008/4376	Controlled Action	Completed
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Pelican Point residential subdivision	2006/2529	Controlled Action	Completed
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Pruning of Mangrove bushes along Lyall Inlet for hovercraft access, Tooradin Ai	2007/3826	Controlled Action	Completed
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Estate, 251-319 Melaluka Rd	2007/3308	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Residential Subdivision and Stormwater Enhancements for land west of Ash Road	2012/6544	Controlled Action	Completed
Robbins Island Road to Hampshire Transmission Line	2020/8656	Controlled Action	Referral Decision
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Tarkine Forest Drive Road Upgrade	2011/6210	Controlled Action	Post-Approval
Tasmania Natural Gas Project - Stage 2	2001/211	Controlled Action	Post-Approval
The Tarkine Road Project	2009/5169	Controlled Action	Completed
Thomson River Mercury Recovery Project	2010/5734	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
Upgrade and expansion of existing Yaringa Boat Harbour	2011/6014	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Viva Energy Gas Terminal Project	2020/8838	Controlled Action	Assessment Approach
Warralily - East Precinct Sparrowale Outfall, stormwater bypass channel, Armstrong Creek, Vic	2015/7553	Controlled Action	Post-Approval
Western Treatment Plant Environment Improvement Project (post Effluent Reuse Stage 2)	2002/688	Controlled Action	Post-Approval
White Rock Wind Farm	2003/986	Controlled Action	Completed
Windfarm	2003/1109	Controlled Action	Completed
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Wyndham Cove marina and residential development	2004/1331	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Acquistion of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Allendale wind farm	2007/3549	Not Controlled Action	Completed
Allmans Levee Track - Maintenance Work	2003/1053	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Aquaculture facility for rainbow trout and yabbies and recreational facilities	2002/822	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Barwon River Parkland Initiative, Tait's Point, Stages 1 and 2	2010/5437	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Bass Basin - Pee Jay-1 - Drilling Program	2007/3908	Not Controlled Action	Completed
Batemans Bay Marina Redevelopment	2008/4265	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
Caswell Street - Moruya East	2020/8781	Not Controlled Action	Completed
Clearance of native vegetation to create fire breaks	2004/1534	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Construction of a Dwelling	2011/6160	Not Controlled Action	Completed
Construction of a flexi mat boat ramp	2011/5838	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Conversion of the North Western Victoria rail system from broad gauge to standar	2002/657	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Creation of a habitat sanctuary at 550 Manks Road, Tooradin, VIC	2013/6845	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
development of retirement resort	2004/1828	Not Controlled Action	Completed
Development of service station and restaurant Tooradin, Victoria	2013/6936	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
DOFA weed eradication program at Goorooyaroo NSW	2003/1270	Not Controlled Action	Completed
Dredging of Tuross Lake channel and depositon of spoil in lake	2004/1554	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Eden Wind Farm	2011/6037	Not Controlled Action	Completed
Eight Mile Creek Drainage Works, Peacocks Road, Eight Mile Creek, SA	2014/7170	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Erosion Trials - planting and pile program of >300 mangroves	2006/2856	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Expansion and upgrade of Biogas Utilisation Facilities at the Western Treatment	2005/2183	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Extension of Mountain View basalt quarry by 113 hectares (stage one)	2004/1591	Not Controlled Action	Completed
Fabrication and Spooling of Pipe Strings at Crib Point	2008/4127	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Floating Observation Platform, Tooradin Channel	2006/2766	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Geelong Bypass Sections 1 & 2	2005/2097	Not Controlled Action	Completed
George Bass Drive Lilli Pilli Road Realignment	2021/8876	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Gleneig Spiny Crayfish Habitat Rehabilitation	2011/6164	Not Controlled Action	Completed
Golf Course Extension	2001/215	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Illuka Residential Estate	2007/3224	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Kongorong Wind Farm	2002/568	Not Controlled Action	Completed
Laslett Wind Farm	2007/3550	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Lot 5 Pelican Point Road, Pelican Point SA - Proposed New Dwelling	2021/9011	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance dredging of Yaringa Channel	2004/1360	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Milton/Ulladulla Sewerage Scheme	2001/251	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Multi-species Aquaculture Enterprise	2001/404	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Oceanlinx South Australia 1mW Greenwave Project	2012/6528	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Piccaninnie Ponds flow path restoration project, SA	2013/6711	Not Controlled Action	Completed
Pioneer Road and bridge Duplication	2012/6291	Not Controlled Action	Completed
Pipeline easement regrowth removal	2011/5817	Not Controlled Action	Completed
Point Cooke Coastal Trail	2001/324	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Port Welshpool Harbour Dredging	2007/3521	Not Controlled Action	Completed
Power Station	2001/239	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Re-alignment of Breakwater Road	2006/2762	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Regional Fast Rail Project - Geelong Country Works Package	2002/577	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Removal of Sludge to Produce Dried Biosolids, Western Treatment Plant	2002/890	Not Controlled Action	Completed
Removal of Strzelecki Gum as part of the Regional Fast Rail Project	2006/2936	Not Controlled Action	Completed
Replacement of Four Bridges on Manks Road	2009/5106	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Development, 409 The Esplanade, St Leonards	2006/2950	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Restricted Recreation Facility - soccer pitch, stadium and associated parking	2006/3034	Not Controlled Action	Completed
Robe Golf Club - Golf Course Extension, SA	2017/7928	Not Controlled Action	Completed
Robe Golf Course, Allotment 2, Davenport Street, Robe, SA	2014/7178	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Sludge handling and biosolids management - Western Treatment Plant	2006/2620	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Sparrovale Wetland stormwater management, Armstrong Creek and Charlemont, VIC	2018/8375	Not Controlled Action	Completed
Spikey Beach 1, West Triton Drilling Program, Bass Basin Permit T/38P	2007/3914	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
Tenby Point Sewerage Pipeline	2001/406	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
To undertake maintenance dredging of the Toora Boat Ramp Channel, VIC	2014/7225	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Upgrade of existing access track	2011/5933	Not Controlled Action	Completed
Upgrade of the existing Thornhill St Sewer Pump Station	2010/5618	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wastewater Treatment System Upgrade	2004/1420	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Water capture to restore wetlands	2007/3223	Not Controlled Action	Completed
Western Treatment Plant Groyne and Beach Works	2001/185	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm	2002/691	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Wooralla Drive pump station, pipeline and associated works	2005/2450	Not Controlled Action	Completed
Wreck Bay Housing Development	2001/299	Not Controlled Action	Completed
WTP 115E Lagoon Seawall, Western Treatment Plant WTP, Werribee Victoria	2019/8577	Not Controlled Action	Completed
WTP Effluent Discharge Improvement Works (Multiple Outlets), Werribee, Vic	2015/7619	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D & 3D seismic survey T/39P	2005/2237	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey, EPP33	2004/1794	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4131	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
2D Siesmic Marine Survey	2008/4074	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey	2008/4528	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Road Settlement Road to Reserve Road Duplication Project	2020/8737	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bitumen Storage Facility	2007/3676	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Collection of cast bull kelp	2002/813	Not Controlled Action (Particular Manner)	Post-Approval
construction of a 14km , 33kV distribution line, including connection to the Lake Bonney Central win	2003/1108	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construction of Stormwater Harvesting Dam, Anakie Road, Lovely Banks VIC	2009/5001	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Corio Bay Channel Safety Adjustment Program	2011/6208	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
development of retirement village, Bellarine Lakes Golf Course, Bellarine Hwy	2006/3015	Not Controlled Action (Particular Manner)	Post-Approval
DIDR01 Wetlands, Barwon Heads Road, Armstrong Creek	2020/8835	Not Controlled Action (Particular Manner)	Post-Approval
Drainage, Trenching & Cable Laying as Part of the Regional Fast Rail Project	2003/1133	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
extension of a sporting facility and upgrading of associated infrastructure	2004/1325	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Installation of a 17x6m floating pontoon adjacent to existing boat ramp	2009/4842	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Lakes Oil 3D Seismic Survey	2002/768	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness PT 2	2006/3044	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness WHA	2004/1846	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance dredging of 150,000 cubic metres of sediment in Burnie Port and du	2004/1569	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Maintenance Dredging Program	2009/4953	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Point Wilson Explosives Area Waterside Infrastructure Remediation	2012/6376	Not Controlled Action (Particular Manner)	Post-Approval
Rail Upgrades at Geelong Port Project	2010/5363	Not Controlled Action (Particular Manner)	Post-Approval
Regional Fibre Optic Project (RFOP)	2003/913	Not Controlled Action (Particular Manner)	Post-Approval
Removal of Tasmanian blue gums	2004/1356	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Remove silt build up on existing swales around the perimeter of the Three Hummo	2010/5676	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey in Petroleum Permit Area EPP27	2002/648	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Soil and Organic Recycling Facility	2005/2216	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
supersonic missile launch facility	2000/120	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Trial Growing Mullet in Western Treatment Plant Sewage Ponds	2009/4812	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Upgrade of Arthur River Road	2003/930	Not Controlled Action (Particular Manner)	Post-Approval
Upgrade of capacity and supporting infrastructure, Western Treatment Plant	2009/5036	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Vegetation clearance and residential subdivision near Mt Gambier	2004/1370	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Waterfront Facility at HMAS Creswell	2002/658	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
2D Seismic Survey	2008/3978	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in	2009/4787	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
<u>Victoria.</u>			
<u>Alteration Reconstruction Restoration and Repairs to Buildings</u>	2008/4179	Referral Decision	Completed
<u>Beardie-1 Field wildcat oil well</u>	2001/469	Referral Decision	Completed
<u>Beecroft Weapons Range Visitors Centre</u>	2004/1322	Referral Decision	Completed
<u>Breeding program for Grey Nurse Sharks</u>	2007/3245	Referral Decision	Completed
<u>Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P</u>	2010/5322	Referral Decision	Completed
<u>Holloman 2010 Vic/P60 3D Seismic Acquisition Survey Program</u>	2009/5251	Referral Decision	Completed
<u>Kelly Channel Discharge, Macquarie Harbour, Tasmania</u>	2017/8057	Referral Decision	Completed
<u>Land clearing for stock grazing</u>	2005/2176	Referral Decision	Completed
<u>Longtom 5 Offshore Production Drilling (VIC/L29)</u>	2012/6404	Referral Decision	Completed
<u>Longtom-5 Offshore Production Drilling (Vic/L29)</u>	2012/6413	Referral Decision	Completed
<u>Portland Wave Energy Project</u>	2008/3946	Referral Decision	Completed
<u>Residential Development Elizabeth Avenue, Rosebud West, VIC</u>	2015/7603	Referral Decision	Completed
<u>Shark 3D Seismic Survey</u>	2007/3294	Referral Decision	Completed
<u>Stanton 3D Marine Seismic Survey</u>	2013/6764	Referral Decision	Completed
<u>The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC</u>	2012/6545	Referral Decision	Completed
<u>Upgrade of Corringale Road</u>	2009/4825	Referral Decision	Completed
<u>Upgrade of Services Infrastructure Point Nepean Quarantine Station</u>	2008/4591	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm	2001/139	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Stati	2008/4156	Referral Decision	Completed

Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Bonney Coast Upwelling	South-east
Canyons on the eastern continental slope	Temperate east
Seamounts South and east of Tasmania	South-east
Shelf rocky reefs	Temperate east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur
Seabirds		
Ardena carneipes		
Flesh-footed Shearwater [82404]	Foraging	Known to occur
Ardena grisea		
Sooty Shearwater [82651]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Ardenna grisea Sooty Shearwater [82651]	Foraging	Likely to occur
Ardenna grisea Sooty Shearwater [82651]	Foraging	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Likely to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Macronectes giganteus Southern Giant Petrel [1060]	Foraging	Known to occur
Macronectes halli Northern Giant Petrel [1061]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Oceanites oceanites Wilson's Storm Petrel [1034]	Migration	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Likely to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Thalassarche bulleri Buller's Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche cauta steadi White-capped Albatross [82344]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Likely to occur
Thalasseus bergii Crested Tern [83000]	Breeding	Known to occur
Thalasseus bergii Crested Tern [83000]	Foraging	Likely to occur
Seals		
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Known to occur
Neophoca cinerea Australian Sea Lion [22]	Foraging (male and female)	Known to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevipoda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur

Bioregional Assessments

[[Resource Information](#)]

SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website
Sydney	Sydney Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 07-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP/79 North Operational Area

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	41
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	16
Key Ecological Features (Marine):	None
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
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Spinifex Offshore Surveys	2022/09359		Completed
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Controlled action

Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
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Otway Development	2002/621	Controlled Action	Post-Approval
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VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
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Not controlled action

Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
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INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
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VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
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Not controlled action (particular manner)

Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
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Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
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INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
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Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis		
Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator		
Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix		
Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri		
Bullers Albatross [64460]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur

Sharks

Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP/79 North 2 km Sound EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	41
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	16
Key Ecological Features (Marine):	None
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardeanna grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Fish

Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Current Scientific Name	Status	Type of Presence
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals [[Resource Information](#)]

Title of referral	Reference	Referral Outcome	Assessment Status
Spinifex Offshore Surveys	2022/09359		Completed

Controlled action

Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed

Not controlled action

Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed

Not controlled action (particular manner)

Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis		
Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator		
Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix		
Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri		
Bullers Albatross [64460]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur

Sharks

Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus breviceuda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 North OA 3.59km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	41
Listed Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	18
Key Ecological Features (Marine):	1
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

Threatened Category

Presence Text

BIRD

[Ardena grisea](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Fish

Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Current Scientific Name	Status	Type of Presence
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals [[Resource Information](#)]

Title of referral	Reference	Referral Outcome	Assessment Status
Spinifex Offshore Surveys	2022/09359		Completed

Controlled action

Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed

Not controlled action

Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed

Not controlled action (particular manner)

Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		(Particular Manner)	
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 North OA 12.6km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	41
Listed Migratory Species:	41

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	28
Key Ecological Features (Marine):	2
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name

[Giant Kelp Marine Forests of South East Australia](#)

Threatened Category

Endangered

Presence Text

Community may occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name

BIRD

[Ardenna grisea](#)

Sooty Shearwater [82651]

Threatened Category

Vulnerable

Presence Text

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Vulnerable

Species or species habitat may occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Vulnerable

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals [Resource Information]			
Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardena pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur

Whales

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 north OA 22.8km Noise EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	87
Listed Migratory Species:	66

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	105
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	4
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	39
Key Ecological Features (Marine):	2
Biologically Important Areas:	18
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat may occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat may occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands

[[Resource Information](#)]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name

State

Defence

Defence - WARRNAMBOOL TRAINING DEPOT [21111]

VIC

Listed Marine Species

[[Resource Information](#)]

Scientific Name

Threatened Category

Presence Text

Bird

[Actitis hypoleucos](#)

Common Sandpiper [59309]

Species or species habitat known to occur within area

[Anseranas semipalmata](#)

Magpie Goose [978]

Species or species habitat may occur within area overfly marine area

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat likely to occur within area overfly marine area

[Ardenna carneipes](#) as [Puffinus carneipes](#)

Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]

Species or species habitat known to occur within area

[Ardenna grisea](#) as [Puffinus griseus](#)

Sooty Shearwater [82651]

Vulnerable

Species or species habitat may occur within area

[Ardenna tenuirostris](#) as [Puffinus tenuirostris](#)

Short-tailed Shearwater [82652]

Breeding known to occur within area

[Arenaria interpres](#)

Ruddy Turnstone [872]

Vulnerable

Roosting known to occur within area

[Bubulcus ibis](#) as [Ardea ibis](#)

Cattle Egret [66521]

Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Current Scientific Name	Status	Type of Presence
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Bay of Islands Coastal Park	Conservation Park	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Gilliear W.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Merri	Marine Sanctuary	VIC

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Lower Merri River Wetlands	VIC

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Spinifex Offshore Surveys	2022/09359		Completed

Controlled action

Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed

Not controlled action

Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			

Key Ecological Features [[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevipinna Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipinna Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 North OA 20km Light EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	86
Listed Migratory Species:	66

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	105
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	39
Key Ecological Features (Marine):	2
Biologically Important Areas:	18
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat may occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat may occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat likely to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardena carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Mammal

Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		

Current Scientific Name	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Bay of Islands Coastal Park	Conservation Park	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Merri	Marine Sanctuary	VIC

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
West Victoria RFA	Victoria

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		(Particular Manner)	
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
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Key Ecological Features

[\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		

Scientific Name	Behaviour	Presence
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur

Scientific Name	Behaviour	Presence
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 27-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP/79 North 49 km Flaring EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	2
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	106
Listed Migratory Species:	66

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	19
Commonwealth Heritage Places:	None
Listed Marine Species:	108
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	43
Regional Forest Agreements:	1
Nationally Important Wetlands:	4
EPBC Act Referrals:	92
Key Ecological Features (Marine):	2
Biologically Important Areas:	17
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status
Budj Bim Cultural Landscape	VIC	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Indigenous

Budj Bim National Heritage Landscape - Tyrendarra Area	VIC	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Glenelg estuary and discovery bay wetlands	Within 10km of Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area

Community Name	Threatened Category	Presence Text
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community may occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat known to occur within area

FISH

Scientific Name	Threatened Category	Presence Text
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area

FROG

Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
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INSECT

Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
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MAMMAL

Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat may occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area
Dipodium campanulatum Bell Flower Hyacinth Orchid [55051]	Endangered	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa stagnatilis		
Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC

Commonwealth Land Name	State
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC

Listed Marine Species	[Resource Information]
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Scientific Name	Threatened Category	Presence Text
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Bird		
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Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Current Scientific Name	Status	Type of Presence
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Bay of Islands Coastal Park	Conservation Park	VIC
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Broadwater I90 B.R.	Natural Features Reserve	VIC
Broadwater I91 B.R.	Natural Features Reserve	VIC
Brucknell Creek F.F.R	Nature Conservation Reserve	VIC
Budj Bim	National Park	VIC
Cape Nelson	State Park	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Deen Maar	Indigenous Protected Area	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Ecklin South Swamp N.C.R.	Natural Features Reserve	VIC
Fitzroy River SS.R.	Natural Features Reserve	VIC
Framlingham Forest	Indigenous Protected Area	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Gorae B.R.	Natural Features Reserve	VIC
Hopkins Falls S.R.	Natural Features Reserve	VIC
Hopkins River, Framlingham SS.R.	Natural Features Reserve	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Gilleard W.R	Natural Features Reserve	VIC
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Merri	Marine Sanctuary	VIC
Narrawong F.R.	Nature Conservation Reserve	VIC
Nullawarre F.R.	Nature Conservation Reserve	VIC
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Pretty Hill F.R	Nature Conservation Reserve	VIC
St Helens F.R	Nature Conservation Reserve	VIC
The Arches	Marine Sanctuary	VIC
Timboon I1 B.R	Natural Features Reserve	VIC
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC
Twelve Apostles	Marine National Park	VIC
Tyrendarra	Indigenous Protected Area	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed P0059	Private Nature Reserve	VIC
Unnamed P0126	Private Nature Reserve	VIC
Woolsthorpe N.C.R.	Natural Features Reserve	VIC
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC

Regional Forest Agreements

[[Resource Information](#)]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name

State

[West Victoria RFA](#)

Victoria

Nationally Important Wetlands

[[Resource Information](#)]

Wetland Name

State

[Cobden-Terang Volcanic Craters](#)

VIC

[Lower Merri River Wetlands](#)

VIC

[Tower Hill](#)

VIC

[Yambuk Wetlands](#)

VIC

EPBC Act Referrals

[[Resource Information](#)]

Title of referral

Reference

Referral Outcome

Assessment Status

[Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies](#)

2023/09629

Referral Decision

[Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East](#)

2024/09795

Completed

[Otway Astrolabe 3D Marine Seismic Survey, Otway Basin](#)

2012/6421

Completed

[Southern Winds Offshore Wind Project](#)

2022/09435

Assessment

[Southern Winds Offshore Wind Project Initial Marine Field Investigations](#)

2022/09436

Completed

[Spinifex Offshore Surveys](#)

2022/09359

Completed

[Willatook Wind Farm, Vic](#)

2019/8439

Assessment

Controlled action

[Alston-1 petroleum exploration well, permit VIC/P44](#)

2003/1315

Controlled Action

Post-Approval

[Casino Gas Field Development](#)

2003/1295

Controlled Action

Post-Approval

[Kentbruck Green Power Hub, Vic](#)

2019/8510

Controlled Action

Assessment Approach

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hawkesdale Wind Farm	2005/2140	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Ryan Corner Wind Farm	2006/2937	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Shaw River Power Station Project	2009/5088	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
Tarrone Power Station Project	2010/5299	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Wind farm development	2005/1960	Not Controlled Action	Completed
Wind Farm Development	2004/1929	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline Crossing at Mount Emu Creek	2009/4913	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur

Whales

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP/79 North MDO (moderate threshold) EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	102
Listed Migratory Species:	66

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	111
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	23
Regional Forest Agreements:	1
Nationally Important Wetlands:	4
EPBC Act Referrals:	90
Key Ecological Features (Marine):	2
Biologically Important Areas:	24
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Glenelg estuary and discovery bay wetlands	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community may occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area

Community Name	Threatened Category	Presence Text
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat may occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south- eastern) [68050]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat likely to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Unknown	
Commonwealth Land - [21492]	VIC
Commonwealth Land - [21583]	VIC

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area

Current Scientific Name	Status	Type of Presence
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Apollo	Multiple Use Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Great Otway	National Park	VIC
Johanna Falls S.R.	Natural Features Reserve	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Gilleard W.R	Natural Features Reserve	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Merri	Marine Sanctuary	VIC
Parker River	Reference Area	VIC
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Portland H47 B.R.	Natural Features Reserve	VIC
Princetown W.R	Natural Features Reserve	VIC
Stony Creek (Otways)	Reference Area	VIC
The Arches	Marine Sanctuary	VIC
Twelve Apostles	Marine National Park	VIC
Yambuk F.F.R.	Nature Conservation Reserve	VIC

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Princetown Wetlands	VIC

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Not controlled action			
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm	2001/139	Referral Decision	Completed

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
<u>Thalassarche cauta cauta</u> Shy Albatross [82345]	Foraging likely	Likely to occur
<u>Thalassarche chlororhynchos bassi</u> Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
<u>Thalassarche melanophris</u> Black-browed Albatross [66472]	Foraging	Known to occur
<u>Thalassarche melanophris impavida</u> Campbell Albatross [82449]	Foraging	Known to occur

Sharks

<u>Carcharodon carcharias</u> White Shark [64470]	Distribution	Likely to occur
<u>Carcharodon carcharias</u> White Shark [64470]	Distribution	Known to occur
<u>Carcharodon carcharias</u> White Shark [64470]	Distribution (low density)	Likely to occur
<u>Carcharodon carcharias</u> White Shark [64470]	Foraging	Known to occur
<u>Carcharodon carcharias</u> White Shark [64470]	Known distribution	Known to occur

Whales

<u>Balaenoptera musculus brevipcauda</u> Pygmy Blue Whale [81317]	Distribution	Known to occur
<u>Balaenoptera musculus brevipcauda</u> Pygmy Blue Whale [81317]	Foraging	Likely to be present
<u>Balaenoptera musculus brevipcauda</u> Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
<u>Balaenoptera musculus brevipcauda</u> Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 05-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP/79 North MDO (low threshold) EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	3
Wetlands of International Importance (Ramsar)	6
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	11
Listed Threatened Species:	146
Listed Migratory Species:	81

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	51
Commonwealth Heritage Places:	8
Listed Marine Species:	135
Whales and Other Cetaceans:	32
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	8
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	164
Regional Forest Agreements:	3
Nationally Important Wetlands:	26
EPBC Act Referrals:	261
Key Ecological Features (Marine):	3
Biologically Important Areas:	35
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Glenelg estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Piccaninnie ponds karst wetlands	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Species or species habitat may occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Foraging, feeding or related behaviour known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area

Scientific Name	Threatened Category	Presence Text
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat known to occur within area
FISH		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Nannoperca variegata Variegated Pygmy Perch, Ewens Pygmy Perch, Golden Pygmy Perch [26178]	Vulnerable	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
INSECT		
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
OTHER		
Hyridella glenelgensis Glenelg Freshwater Mussel [82953]	Critically Endangered	Species or species habitat may occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat known to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat known to occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat likely to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris halmaturina subsp. halmaturina Kangaroo Island Pomaderris [21964]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Taraxacum cygnorum Coast Dandelion, Native Dandelion [2508]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area

REPTILE

Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area

SHARK

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Foraging, feeding or related behaviour known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Foraging, feeding or related behaviour known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC

Commonwealth Land Name	State
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC

Transport and Regional Services - Australian Maritime Safety Authority

Commonwealth Land - Australian Maritime Safety Authority [41289]	SA
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Commonwealth Land Name	State
Commonwealth Land - Australian Maritime Safety Authority [41288]	SA
Unknown	
Commonwealth Land - [21487]	VIC
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21582]	VIC
Commonwealth Land - [21489]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [22391]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [60111]	TAS
Commonwealth Land - [21492]	VIC
Commonwealth Land - [60112]	TAS
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21490]	VIC

Commonwealth Heritage Places		[Resource Information]
Name	State	Status
Historic		
Cape Northumberland Lighthouse	SA	Listed place
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Foraging, feeding or related behaviour known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Whales and Other Cetaceans [Resource Information]		
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Physeter macrocephalus Sperm Whale [59]		Foraging, feeding or related behaviour known to occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Beagle	Multiple Use Zone (IUCN VI)	
Franklin	Multiple Use Zone (IUCN VI)	
Murray	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Murray	Special Purpose Zone (IUCN VI)	
Nelson	Special Purpose Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Aireys Inlet B.R.	Natural Features Reserve	VIC
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthurs Seat	State Park	VIC
Badger Box Creek	Nature Reserve	TAS
Bald Hills B.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bats Ridge W.R	Nature Conservation Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Black Pyramid Rock	Nature Reserve	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Bucks Lake	Game Reserve	SA
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Calder River	Reference Area	VIC
Canunda	National Park	SA

Protected Area Name	Reserve Type	State
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS
Carpenter Rocks	Conservation Park	SA
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Deen Maar	Indigenous Protected Area	VIC
Devils Tower	Nature Reserve	TAS
Dingley Dell	Conservation Park	SA
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Douglas Point	Conservation Park	SA
Dromana B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Dry Creek	Forest Reserve	SA
Eagle Rock	Marine Sanctuary	VIC
East Moncoeur Island	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Ewens Ponds	Conservation Park	SA
Fingal B.R	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Glenelg River	Heritage River	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Gorae B.R.	Natural Features Reserve	VIC
Great Otway	National Park	VIC
Hedditch Hill S.R.	Natural Features Reserve	VIC
Hogan Group	Conservation Area	TAS
Hopkins Falls S.R.	Natural Features Reserve	VIC
Johanna Falls S.R.	Natural Features Reserve	VIC
Johnstones Creek F.R	Nature Conservation Reserve	VIC
Kentbruck H14 B.R	Natural Features Reserve	VIC
Kentbruck H50 B.R.	Natural Features Reserve	VIC
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Gilleard W.R	Natural Features Reserve	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Lily Pond B.R.	Natural Features Reserve	VIC
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lower Glenelg	National Park	VIC
Lower Glenelg River	Conservation Park	SA
Lower South East	Marine Park	SA
Main Ridge N.C.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC
Mornington Peninsula	National Park	VIC
Mount Richmond	National Park	VIC
Mount Vereker Creek	Natural Catchment Area	VIC
Mouzie B.R	Natural Features Reserve	VIC
Mouzie N.F.R	Natural Features Reserve	VIC
Muddy Lagoon	Nature Reserve	TAS
Mushroom Reef	Marine Sanctuary	VIC

Protected Area Name	Reserve Type	State
Narrawong F.R.	Nature Conservation Reserve	VIC
Nelson SS.R.	Natural Features Reserve	VIC
Nene Valley	Conservation Park	SA
New Year Island	Game Reserve	TAS
North East Islet	Nature Reserve	TAS
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Phillip Island Nature Park	Other	VIC
Piccaninnie Ponds	Conservation Park	SA
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Red Hut Point	Conservation Area	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reid Rocks	Nature Reserve	TAS
Rodondo Island	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Rosebud B.R.	Natural Features Reserve	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	Conservation Area	TAS
Seal Rocks	State Reserve	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Sugarloaf Rock	Conservation Area	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tathams Lagoon	Conservation Area	TAS
The Arches	Marine Sanctuary	VIC
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Twelve Apostles	Marine National Park	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed (No.HA1038)	Heritage Agreement	SA
Unnamed (No.HA1166)	Heritage Agreement	SA
Unnamed (No.HA1180)	Heritage Agreement	SA
Unnamed (No.HA1404)	Heritage Agreement	SA

Protected Area Name	Reserve Type	State
Unnamed (No.HA1457)	Heritage Agreement	SA
Unnamed (No.HA1560)	Heritage Agreement	SA
Unnamed (No.HA26)	Heritage Agreement	SA
Unnamed (No.HA42)	Heritage Agreement	SA
Unnamed (No.HA497)	Heritage Agreement	SA
Unnamed P0176	Private Nature Reserve	VIC
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Waratah B.R	Natural Features Reserve	VIC
West Moncoeur Island	Nature Reserve	TAS
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	Marine National Park	VIC
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilson's Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilson's Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC
Yanakie F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
Gippsland RFA	Victoria
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Bungaree Lagoon	TAS
Corner Inlet	VIC
Ewens Ponds	SA
Glenelg Estuary	VIC
Glenelg River	VIC
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS

Wetland Name	State
Lavinia Nature Reserve	TAS
Long Swamp	VIC
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Mud Islands	VIC
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Piccaninnie Ponds	SA
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Shallow Inlet Marine & Coastal Park	VIC
Swan Bay & Swan Island	VIC
Tower Hill	VIC
Western Port	VIC
Yambuk Wetlands	VIC

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Glenelg Dolomite Quarry	2017/8021	Controlled Action	Post-Approval
Green Point Wind Farm	2001/529	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Pelican Point residential subdivision	2006/2529	Controlled Action	Completed
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Allendale wind farm	2007/3549	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Eight Mile Creek Drainage Works, Peacocks Road, Eight Mile Creek, SA	2014/7170	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gleneig Spiny Crayfish Habitat Rehabilitation	2011/6164	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Kongorong Wind Farm	2002/568	Not Controlled Action	Completed
Laslett Wind Farm	2007/3550	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Lot 5 Pelican Point Road, Pelican Point SA - Proposed New Dwelling	2021/9011	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Oceanlinx South Australia 1mW Greenwave Project	2012/6528	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Piccaninnie Ponds flow path restoration project, SA	2013/6711	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Upgrade of existing access track	2011/5933	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm	2002/691	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey, EPP33	2004/1794	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
2D Siesmic Marine Survey	2008/4074	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
construction of a 14km , 33kV distribution line, including connection to the Lake Bonney Central win	2003/1108	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Oil 3D Seismic Survey	2002/768	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey in Petroleum Permit Area EPP27	2002/648	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vegetation clearance and residential subdivision near Mt Gambier	2004/1370	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval

Referral decision

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
2D Seismic Survey	2008/3978	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Darymple 3D Seismic Survey. Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm	2001/139	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Stati	2008/4156	Referral Decision	Completed

Key Ecological Features [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [\[Resource Information \]](#)

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Seals		
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Known to occur

Scientific Name	Behaviour	Presence
Neophoca cinerea Australian Sea Lion [22]	Foraging (male and female)	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevipcauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipcauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipcauda Pygmy Blue Whale [81317]	Foraging (abundant food source)	Known to occur
Balaenoptera musculus brevipcauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevipcauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Physeter macrocephalus Sperm Whale [59]	Foraging likely (abundant food source)	Known to occur

Scientific Name	Behaviour	Presence
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Bioregional Assessments		[Resource Information]
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SubRegion	BioRegion	Website
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Gippsland	Gippsland Basin	BA website
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Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



VICP79 North LOWC Mod

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	4
Wetlands of International Importance (Ramsar)	7
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	12
Listed Threatened Species:	166
Listed Migratory Species:	81

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	76
Commonwealth Heritage Places:	9
Listed Marine Species:	136
Whales and Other Cetaceans:	32
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	7
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	223
Regional Forest Agreements:	3
Nationally Important Wetlands:	26
EPBC Act Referrals:	293
Key Ecological Features (Marine):	3
Biologically Important Areas:	34
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Gippsland lakes	Within 10km of Ramsar site
Glenelg estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Piccaninnie ponds karst wetlands	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities

[[Resource Information](#)]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community likely to occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Acanthiza pusilla magnirostris King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
<i>Calyptorhynchus banksii graptogyne</i> South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Foraging, feeding or related behaviour known to occur within area
<i>Ceyx azureus diemenensis</i> Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat known to occur within area
<i>Charadrius leschenaultii</i> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
<i>Charadrius mongolus</i> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
<i>Climacteris picumnus victoriae</i> Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
<i>Diomedea antipodensis</i> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Diomedea antipodensis gibsoni</i> Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Diomedea epomophora</i> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
<i>Diomedea exulans</i> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat known to occur within area
FISH		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Nannoperca variegata Variegated Pygmy Perch, Ewens Pygmy Perch, Golden Pygmy Perch [26178]	Vulnerable	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat may occur within area
INSECT		
Oreisplanus munionga larana Marawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
<i>Isoodon obesulus obesulus</i> Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south- eastern) [68050]	Endangered	Species or species habitat known to occur within area
<i>Mastacomys fuscus mordicus</i> Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
<i>Miniopterus orianae bassanii</i> Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
<i>Neophoca cinerea</i> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
<i>Perameles gunnii gunnii</i> Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat likely to occur within area
<i>Perameles gunnii Victorian subspecies</i> Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
<i>Petauroides volans</i> Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
<i>Petaurus australis australis</i> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
<i>Potorous tridactylus trisulcatus</i> Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
<i>Pseudomys fumeus</i> Smoky Mouse, Koonoom [88]	Endangered	Species or species habitat may occur within area
<i>Pseudomys novaehollandiae</i> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
OTHER		
Hyridella glenelgensis Glenelg Freshwater Mussel [82953]	Critically Endangered	Species or species habitat may occur within area
PLANT		
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat known to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat known to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat known to occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat may occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat likely to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris halmaturina subsp. halmaturina Kangaroo Island Pomaderris [21964]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum litorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat likely to occur within area
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Taraxacum cygnorum Coast Dandelion, Native Dandelion [2508]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Tymanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]	VIC
Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20102]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20104]	VIC
Defence - HMAS CERBERUS [20103]	VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20101]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20098]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20088]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20082]	VIC
Defence - HMAS CERBERUS [20083]	VIC
Defence - HMAS CERBERUS [20084]	VIC
Defence - HMAS CERBERUS [20080]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC

Commonwealth Land Name	State
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC
Transport and Regional Services - Australian Maritime Safety Authority	
Commonwealth Land - Australian Maritime Safety Authority [41288]	SA
Commonwealth Land - Australian Maritime Safety Authority [41289]	SA
Unknown	
Commonwealth Land - [60111]	TAS
Commonwealth Land - [21491]	VIC

Commonwealth Land Name	State
Commonwealth Land - [21490]	VIC
Commonwealth Land - [21492]	VIC
Commonwealth Land - [60112]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [21489]	VIC
Commonwealth Land - [22391]	VIC
Commonwealth Land - [21488]	VIC
Commonwealth Land - [21582]	VIC

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic		
Cape Northumberland Lighthouse	SA	Listed place
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
HMAS Cerberus Central Area Group	VIC	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
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Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Migration route known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
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[Neophoca cinerea](#)

Australian Sea-lion, Australian Sea Lion [22]

Endangered

Species or species habitat known to occur within area

Reptile

[Caretta caretta](#)

Loggerhead Turtle [1763]

Endangered

Foraging, feeding or related behaviour known to occur within area

[Chelonia mydas](#)

Green Turtle [1765]

Vulnerable

Species or species habitat known to occur within area

[Dermochelys coriacea](#)

Leatherback Turtle, Leathery Turtle, Luth [1768]

Endangered

Foraging, feeding or related behaviour known to occur within area

[Eretmochelys imbricata](#)

Hawksbill Turtle [1766]

Vulnerable

Species or species habitat likely to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name

Status

Type of Presence

Mammal

[Balaenoptera acutorostrata](#)

Minke Whale [33]

Species or species habitat may occur within area

[Balaenoptera bonaerensis](#)

Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]

Species or species habitat likely to occur within area

[Balaenoptera borealis](#)

Sei Whale [34]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

[Balaenoptera edeni](#)

Bryde's Whale [35]

Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	
Apollo	Multiple Use Zone (IUCN VI)	
Beagle	Multiple Use Zone (IUCN VI)	
Franklin	Multiple Use Zone (IUCN VI)	
Murray	Multiple Use Zone (IUCN VI)	
Zeehan	Multiple Use Zone (IUCN VI)	
Nelson	Special Purpose Zone (IUCN VI)	
Zeehan	Special Purpose Zone (IUCN VI)	

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Aireys Inlet B.R.	Natural Features Reserve	VIC
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthur-Pieman	Conservation Area	TAS
Badger Box Creek	Nature Reserve	TAS
Bald Hills B.R.	Natural Features Reserve	VIC
Balnarring G95 B.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bass River SS.R.	Natural Features Reserve	VIC
Bats Ridge W.R	Nature Conservation Reserve	VIC
Bay of Islands Coastal Park	Conservation Park	VIC
Bellarine I109 B.R.	Natural Features Reserve	VIC
Bellarine I110 B.R.	Natural Features Reserve	VIC
Black Pyramid Rock	Nature Reserve	TAS
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Buckley N.C.R.	Natural Features Reserve	VIC
Bucks Lake	Game Reserve	SA
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Canunda	National Park	SA
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Wickham	Conservation Area	TAS
Cape Wickham	State Reserve	TAS
Carpenter Rocks	Conservation Park	SA
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corner Inlet	Marine National Park	VIC

Protected Area Name	Reserve Type	State
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Crib Point G228 B.R.	Natural Features Reserve	VIC
Crib Point G229 B.R.	Natural Features Reserve	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Deen Maar	Indigenous Protected Area	VIC
Deep Lagoons	Conservation Area	TAS
Devils Tower	Nature Reserve	TAS
Dingley Dell	Conservation Park	SA
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Douglas Point	Conservation Park	SA
Drakes B.R.	Natural Features Reserve	VIC
Drumdlemara H1 B.R	Natural Features Reserve	VIC
Drumdlemara H2 B.R	Natural Features Reserve	VIC
Drumdlemara H4 B.R	Natural Features Reserve	VIC
Dry Creek	Forest Reserve	SA
Eagle Rock	Marine Sanctuary	VIC
East Moncoeur Island	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Entrance Point	Reference Area	VIC
Ewens Ponds	Conservation Park	SA
Fingal B.R	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
French Island	National Park	VIC
French Island (north)	Reference Area	VIC
French Island G230 B.R	Natural Features Reserve	VIC
Gentle Annie	Conservation Area	TAS
Glenelg River	Heritage River	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Gorae B.R.	Natural Features Reserve	VIC
Great Otway	National Park	VIC
Hedditch Hill S.R.	Natural Features Reserve	VIC
Hoddle Range F.R.	Nature Conservation Reserve	VIC
Hogan Group	Conservation Area	TAS
Hopkins Falls S.R.	Natural Features Reserve	VIC
Johanna Falls S.R.	Natural Features Reserve	VIC
Johnstones Creek F.R	Nature Conservation Reserve	VIC
Kangerong N.C.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Kentbruck H14 B.R	Natural Features Reserve	VIC
Kentbruck H50 B.R.	Natural Features Reserve	VIC
Kentford Forest	Nature Reserve	TAS
Kentford Forest	Conservation Area	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Gillear W.R	Natural Features Reserve	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Leongatha H3 B.R.	Natural Features Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lower Glenelg	National Park	VIC
Lower Glenelg River	Conservation Park	SA
Lower South East	Marine Park	SA
Lymwood	Conservation Covenant	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Merri	Marine Sanctuary	VIC
Merricks Creek B.R.	Natural Features Reserve	VIC
Millwood Road	Conservation Covenant	TAS
Mornington Peninsula	National Park	VIC
Mount Richmond	National Park	VIC
Mount Vereker Creek	Natural Catchment Area	VIC
Mouzie B.R	Natural Features Reserve	VIC
Mouzie N.F.R	Natural Features Reserve	VIC
Muddy Lagoon	Nature Reserve	TAS
Mushroom Reef	Marine Sanctuary	VIC
Narrawong F.R.	Nature Conservation Reserve	VIC
Nelson SS.R.	Natural Features Reserve	VIC
Nene Valley	Conservation Park	SA
New Year Island	Game Reserve	TAS
New Zealand Hill F.R.	Nature Conservation Reserve	VIC
Ninety Mile Beach	Marine National Park	VIC
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
North East Islet	Nature Reserve	TAS
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC
Pegarah	Private Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Phillip Island Nature Park	Other	VIC
Piccaninnie Ponds	Conservation Park	SA
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rodondo Island	Nature Reserve	TAS
Salt Lagoon, St Leonards W.R	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Sartoris Rd Nugara	Conservation Covenant	TAS
Screw Creek N.C.R.	Natural Features Reserve	VIC
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	State Reserve	TAS
Seal Rocks	Conservation Area	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Slaves Bay	Conservation Area	TAS
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Sugarloaf Rock	Conservation Area	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tambar	Conservation Covenant	TAS
Tarwin Lower F.R.	Nature Conservation Reserve	VIC
Tathams Lagoon	Conservation Area	TAS
The Arches	Marine Sanctuary	VIC
Tin Mine Rd Loorana	Conservation Covenant	TAS
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Trewalla H49 B.R.	Natural Features Reserve	VIC
Twelve Apostles	Marine National Park	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed (No.HA1038)	Heritage Agreement	SA
Unnamed (No.HA1166)	Heritage Agreement	SA
Unnamed (No.HA1180)	Heritage Agreement	SA
Unnamed (No.HA1404)	Heritage Agreement	SA
Unnamed (No.HA1457)	Heritage Agreement	SA
Unnamed (No.HA1560)	Heritage Agreement	SA
Unnamed (No.HA26)	Heritage Agreement	SA
Unnamed (No.HA42)	Heritage Agreement	SA
Unnamed (No.HA497)	Heritage Agreement	SA
Unnamed C0293	Private Nature Reserve	VIC
Unnamed P0155	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Waratah B.R	Natural Features Reserve	VIC
West Moncoeur Island	Nature Reserve	TAS
West Point	State Reserve	TAS
Whipstick Gully N.F.R.	Natural Features Reserve	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Wilsons Promontory	National Park	VIC
Wilsons Promontory	Wilderness Zone	VIC
Wilsons Promontory	Marine National Park	VIC
Wilsons Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilsons Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilsons Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonga Wonga South B.R	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC
Yambacoona	Conservation Covenant	TAS
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC
Yanakie F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name

State

[Gippsland RFA](#)

Victoria

[Tasmania RFA](#)

Tasmania

[West Victoria RFA](#)

Victoria

Nationally Important Wetlands

[\[Resource Information \]](#)

Wetland Name

State

[Aire River](#)

VIC

[Anderson Inlet](#)

VIC

[Bungaree Lagoon](#)

TAS

[Corner Inlet](#)

VIC

[Ewens Ponds](#)

SA

[Glenelg Estuary](#)

VIC

[Glenelg River](#)

VIC

[Lake Connewarre State Wildlife Reserve](#)

VIC

[Lake Flannigan](#)

TAS

[Lavinia Nature Reserve](#)

TAS

[Long Swamp](#)

VIC

[Lower Aire River Wetlands](#)

VIC

[Lower Merri River Wetlands](#)

VIC

[Mud Islands](#)

VIC

[Pearshape Lagoon 1](#)

TAS

[Pearshape Lagoon 2](#)

TAS

[Pearshape Lagoon 3](#)

TAS

[Pearshape Lagoon 4](#)

TAS

[Piccaninnie Ponds](#)

SA

Wetland Name	State
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Shallow Inlet Marine & Coastal Park	VIC
Swan Bay & Swan Island	VIC
Tower Hill	VIC
Western Port	VIC
Yambuk Wetlands	VIC

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Gelliondale Wind Farm Project	2023/09577		Assessment
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Controlled action			
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Basalt Quarry Extension (Mountainview Quarry)	2004/1329	Controlled Action	Completed
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Crib Point to Pakenham Gas Pipeline, Vic	2018/8297	Controlled Action	Completed
Dairy Farm expansion on the Woolnorth property	2013/6710	Controlled Action	Completed
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Gas Import Facility, Crib Point, Vic	2018/8298	Controlled Action	Completed
Geelong Salt Fields Urban Renewal Project	2012/6630	Controlled Action	Assessment Approach

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Gleneig Dolomite Quarry	2017/8021	Controlled Action	Post-Approval
Green Point Wind Farm	2001/529	Controlled Action	Post-Approval
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Pelican Point residential subdivision	2006/2529	Controlled Action	Completed
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Estate, 251-319 Melaluka Rd	2007/3308	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Residential Subdivision and Stormwater Enhancements for land west of Ash Road	2012/6544	Controlled Action	Completed
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Acquisition of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Allendale wind farm	2007/3549	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Aquaculture facility for rainbow trout and yabbies and recreational facilities	2002/822	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Barwon River Parkland Initiative, Tait's Point, Stages 1 and 2	2010/5437	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of a Dwelling	2011/6160	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Construction of a flexi mat boat ramp	2011/5838	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
development of retirement resort	2004/1828	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Eight Mile Creek Drainage Works, Peacocks Road, Eight Mile Creek, SA	2014/7170	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Extension of Mountain View basalt quarry by 113 hectares (stage one)	2004/1591	Not Controlled Action	Completed
Fabrication and Spooling of Pipe Strings at Crib Point	2008/4127	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Geelong Bypass Sections 1 & 2	2005/2097	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gleneig Spiny Crayfish Habitat Rehabilitation	2011/6164	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Kongorong Wind Farm	2002/568	Not Controlled Action	Completed
Laslett Wind Farm	2007/3550	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Lot 5 Pelican Point Road, Pelican Point SA - Proposed New Dwelling	2021/9011	Not Controlled Action	Completed
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance dredging of Yaringa Channel	2004/1360	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Oceanlinx South Australia 1mW Greenwave Project	2012/6528	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Piccaninnie Ponds flow path restoration project, SA	2013/6711	Not Controlled Action	Completed
Pipeline easement regrowth removal	2011/5817	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Development, 409 The Esplanade, St Leonards	2006/2950	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Sparrovale Wetland stormwater management, Armstrong Creek and Charlemont, VIC	2018/8375	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wastewater Treatment System Upgrade	2004/1420	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm	2002/691	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey, EPP33	2004/1794	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
2D Siesmic Marine Survey	2008/4074	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular Manner)	Post-Approval
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bitumen Storage Facility	2007/3676	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
construction of a 14km , 33kV distribution line, including connection to the Lake Bonney Central win	2003/1108	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
development of retirement village, Bellarine Lakes Golf Course, Bellarine Hwy	2006/3015	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular Manner)	Post-Approval
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Oil 3D Seismic Survey	2002/768	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular Manner)	Post-Approval
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey in Petroleum Permit Area EPP27	2002/648	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Vegetation clearance and residential subdivision near Mt Gambier	2004/1370	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
2D Seismic Survey	2008/3978	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm	2001/139	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Station	2008/4156	Referral Decision	Completed

Key Ecological Features [[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas [[Resource Information](#)]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Seals		
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Known to occur
Neophoca cinerea Australian Sea Lion [22]	Foraging (male and female)	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur

Bioregional Assessments		[Resource Information]
SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 04-Jun-2024

[Summary](#)

[Details](#)

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[Acknowledgements](#)



VICP79 North LOWC Low EMBA

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	5
Wetlands of International Importance (Ramsar)	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	3
Listed Threatened Ecological Communities:	22
Listed Threatened Species:	221
Listed Migratory Species:	93

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	102
Commonwealth Heritage Places:	13
Listed Marine Species:	153
Whales and Other Cetaceans:	33
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	15
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	382
Regional Forest Agreements:	6
Nationally Important Wetlands:	60
EPBC Act Referrals:	402
Key Ecological Features (Marine):	8
Biologically Important Areas:	64
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status
Tasmanian Wilderness	TAS	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status
Historic		
Great Ocean Road and Scenic Environs	VIC	Listed place
Point Nepean Defence Sites and Quarantine Station Area	VIC	Listed place
Quarantine Station and Surrounds	VIC	Within listed place

Indigenous

Western Tasmania Aboriginal Cultural Landscape	TAS	Listed place
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Natural

Tasmanian Wilderness	TAS	Listed place
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Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site
Edithvale-seaford wetlands	Within 10km of Ramsar site
Gippsland lakes	Within Ramsar site
Glenside estuary and discovery bay wetlands	Within Ramsar site
Lavinia	Within Ramsar site
Piccaninnie ponds karst wetlands	Within Ramsar site
Port phillip bay (western shoreline) and bellarine peninsula	Within Ramsar site
Western port	Within Ramsar site

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name

Feature Name

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area
Araluen Scarp Grassy Forest	Endangered	Community may occur within area
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Gippsland Red Gum (<i>Eucalyptus tereticornis</i> subsp. <i>mediana</i>) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area
Karst springs and associated alkaline fens of the Naracoorte Coastal Plain Bioregion	Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Acanthiza pusilla magnirostris		
King Island Brown Thornbill, Brown Thornbill (King Island) [91709]	Endangered	Species or species habitat known to occur within area
Acanthornis magna greeniana		
King Island Scrubtit, Scrubtit (King Island) [82329]	Critically Endangered	Species or species habitat known to occur within area
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne South-eastern Red-tailed Black-Cockatoo [25982]	Endangered	Foraging, feeding or related behaviour known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Breeding known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Platycercus caledonicus brownii Green Rosella (King Island) [67041]	Vulnerable	Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Breeding known to occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Strepera fuliginosa colei Black Currawong (King Island) [67113]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Astacopsis gouldi Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat likely to occur within area
Euastacus bidawalus Bidawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Euastacus diversus Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Brachiopsilus ziebelli Ziebell's Handfish, Waterfall Bay Handfish [83757]	Vulnerable	Species or species habitat likely to occur within area
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Mordacia praecox Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Endangered	Species or species habitat known to occur within area
Nannoperca variegata Variegated Pygmy Perch, Ewens Pygmy Perch, Golden Pygmy Perch [26178]	Vulnerable	Species or species habitat known to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area
Thymichthys politus Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat known to occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Oreisplanus munionga larana Marrawah Skipper, Alpine Sedge Skipper, Alpine Skipper [77747]	Vulnerable	Species or species habitat known to occur within area
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat known to occur within area
Miniopterus orianae bassanii Southern Bent-wing Bat [87645]	Critically Endangered	Breeding known to occur within area
Mirounga leonina Southern Elephant Seal [26]	Vulnerable	Breeding may occur within area

Scientific Name	Threatened Category	Presence Text
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat likely to occur within area
Perameles gunnii Victorian subspecies Eastern Barred Bandicoot (Mainland) [88020]	Endangered	Translocated population known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pseudomys shortridgei Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
OTHER		
Hyridella glenelgensis Glenelg Freshwater Mussel [82953]	Critically Endangered	Species or species habitat may occur within area
Megascolides australis Giant Gippsland Earthworm [64420]	Vulnerable	Species or species habitat known to occur within area
PLANT		
Acacia caerulescens Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia constablei Narrabarba Wattle [10798]	Critically Endangered	Species or species habitat known to occur within area
Acacia georgensis Bega Wattle [9848]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Astelia australiana Tall Astelia [10851]	Vulnerable	Species or species habitat may occur within area
Astrotricha crassifolia Thick-leaf Star-hair [10352]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268) Wingan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Caladenia calcicola Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area
Caladenia colorata Coloured Spider-orchid, Small Western Spider-orchid, Painted Spider-orchid [54999]	Endangered	Species or species habitat known to occur within area
Caladenia concolor Crimson Spider-orchid, Maroon Spider-orchid [5505]	Vulnerable	Species or species habitat may occur within area
Caladenia dienema Windswept Spider-orchid [64858]	Endangered	Species or species habitat known to occur within area
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia insularis French Island Spider-orchid [24372]	Vulnerable	Species or species habitat known to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat known to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat known to occur within area
Caladenia richardsiorum Little Dip Spider-orchid [55018]	Endangered	Species or species habitat likely to occur within area
Caladenia robinsonii Frankston Spider-orchid [24375]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat known to occur within area
Centrolepis pedderensis Pedder Centrolepis, Pedder Bristlewort [12647]	Endangered	Species or species habitat likely to occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat known to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat known to occur within area
Correa lawrenceana var. genoensis Genoa River Correa [66626]	Endangered	Species or species habitat may occur within area
Corunastylis brachystachya Short-spiked Midge-orchid, Rocky Cape Midge Orchid [76410]	Endangered	Species or species habitat known to occur within area
Corunastylis rhyolitica listed as Genoplesium rhyoliticum Pambula Midge-orchid, Rhyolite Midge Orchid [78697]	Endangered	Species or species habitat likely to occur within area
Corunastylis vernalis listed as Genoplesium vernale East Lynne Midge-orchid [78699]	Vulnerable	Species or species habitat known to occur within area
Craspedia preminghana Preminghana Billybutton [77046]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Deyeuxia ramosa Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area
Diuris basaltica Small Golden Moths Orchid, Early Golden Moths [64654]	Endangered	Species or species habitat may occur within area
Diuris lanceolata Snake Orchid [10231]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus stenostoma Jillaga Ash [3976]	Endangered	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat known to occur within area
Euphrasia collina subsp. muelleri Purple Eyebright, Mueller's Eyebright [16151]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Grevillea infecunda Anglesea Grevillea [22026]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Hiya distans listed as Hypolepis distans Scrambling Ground-fern [92548]	Endangered	Species or species habitat known to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Lachnagrostis adamsonii Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat known to occur within area
Leiocarpa gatesii Wrinkled Buttons [76212]	Vulnerable	Species or species habitat known to occur within area
Leionema ralstonii [64926]	Vulnerable	Species or species habitat known to occur within area
Lepidium aschersonii Spiny Peppercross [10976]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Lomatia tasmanica King's Lomatia [3745]	Critically Endangered	Species or species habitat likely to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Pimelea spinescens subsp. spinescens Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea [21980]	Critically Endangered	Species or species habitat likely to occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Pomaderris halmaturina subsp. halmaturina Kangaroo Island Pomaderris [21964]	Vulnerable	Species or species habitat known to occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum atratum Three Hummock Leek-orchid [82677]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat likely to occur within area
Prasophyllum favonium Western Leek-orchid [64949]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area
Prasophyllum littorale listed as Prasophyllum littorale Coastal Leek Orchid [55234]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum pulchellum Pretty Leek-orchid [64953]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum suaveolens Fragrant Leek-orchid [64956]	Endangered	Species or species habitat may occur within area
Prostanthera galbraithiae Wellington Mintbush [64959]	Vulnerable	Species or species habitat likely to occur within area
Pseudocephalozia paludicola Alpine Leafy Liverwort [66441]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis rubenachii Arthur River Greenhood [64536]	Endangered	Species or species habitat known to occur within area
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat known to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Rutidosia leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat may occur within area
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Taraxacum cygnorum Coast Dandelion, Native Dandelion [2508]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat known to occur within area
Thelymitra orientalis Hoary Sun-orchid [88011]	Critically Endangered	Species or species habitat known to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Westringia davidii [19079]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Zieria tuberculata Warty Zieria [56736]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Carinascincus orocryptus Heath Cool-skink, Mountain Skink [90209]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Tymanocryptis pinguicolla Victorian Grassland Earless Dragon [66727]	Critically Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Zearaja maugeana Maugean Skate, Port Davey Skate [83504]	Endangered	Species or species habitat known to occur within area

Listed Migratory Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat may occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Foraging, feeding or related behaviour known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands

[\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name

State

Communications, Information Technology and the Arts - Australian Postal Corporation

Commonwealth Land - Australian Postal Commission [12052]

NSW

Communications, Information Technology and the Arts - Telstra Corporation Limited

Commonwealth Land - Australian Telecommunications Commission [16089]NSW

Commonwealth Land - Australian Telecommunications Commission [15535]NSW

Commonwealth Land - Australian Telecommunications Commission [12053]NSW

Commonwealth Land - Australian Telecommunications Commission [12265]NSW

Commonwealth Land - Australian Telecommunications Commission [12014]NSW

Commonwealth Land - Australian Telecommunications Commission [15461]NSW

Commonwealth Land - Australian Telecommunications Commission [12050]NSW

Commonwealth Land - Australian Telecommunications Commission [15611]NSW

Commonwealth Land - Telstra Corporation Limited [15888]

NSW

Commonwealth Land - Telstra Corporation Limited [12051]

NSW

Defence

Defence - CROWS NEST CAMP - QUEENSCLIFF [21029]

VIC

Defence - CROWS NEST CAMP - QUEENSCLIFF [21028]

VIC

Defence - CROWS NEST CAMP - QUEENSCLIFF [21027]

VIC

Defence - CROWS NEST CAMP - QUEENSCLIFF [21026]

VIC

Defence - HMAS CERBERUS [20101]

VIC

Defence - HMAS CERBERUS [20102]

VIC

Defence - HMAS CERBERUS [20104]

VIC

Commonwealth Land Name	State
Defence - HMAS CERBERUS [20100]	VIC
Defence - HMAS CERBERUS [20094]	VIC
Defence - HMAS CERBERUS [20095]	VIC
Defence - HMAS CERBERUS [20098]	VIC
Defence - HMAS CERBERUS [20099]	VIC
Defence - HMAS CERBERUS [20093]	VIC
Defence - HMAS CERBERUS [20091]	VIC
Defence - HMAS CERBERUS [20096]	VIC
Defence - HMAS CERBERUS [20097]	VIC
Defence - HMAS CERBERUS [20092]	VIC
Defence - HMAS CERBERUS [20090]	VIC
Defence - HMAS CERBERUS [20103]	VIC
Defence - HMAS CERBERUS [20089]	VIC
Defence - HMAS CERBERUS [20084]	VIC
Defence - HMAS CERBERUS [20088]	VIC
Defence - HMAS CERBERUS [20085]	VIC
Defence - HMAS CERBERUS [20086]	VIC
Defence - HMAS CERBERUS [20087]	VIC
Defence - HMAS CERBERUS [20081]	VIC
Defence - HMAS CERBERUS [20080]	VIC
Defence - HMAS CERBERUS [20083]	VIC
Defence - HMAS CERBERUS [20082]	VIC
Defence - POINT WILSON EXPLOSIVES AREA [21441]	VIC
Defence - POINT WILSON EXPLOSIVES AREA [21442]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21030]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21032]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21031]	VIC

Commonwealth Land Name	State
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21033]	VIC
Defence - STAFF COLLEGE-FORT QUEENSCLIFF [21034]	VIC
Defence - SWAN ISLAND TRAINING AREA [21446]	VIC
Defence - SWAN ISLAND TRAINING AREA [21447]	VIC
Defence - SWAN ISLAND TRAINING AREA [21448]	VIC
Defence - TRAINING CENTRE (Norris Barracks) - Portsea [21025]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21010]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21011]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21012]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21013]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21014]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21015]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21016]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21017]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21018]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21019]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21021]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21020]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21024]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21023]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21022]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21008]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21009]	VIC
Defence - Training Depot, Darts RD 3305 Portland [21007]	VIC
Defence - WARRNAMBOOL TRAINING DEPOT [21111]	VIC
Defence - WEST HEAD GUNNERY RANGE [21112]	VIC

Commonwealth Land Name	State
Commonwealth Land - Australian Maritime Safety Authority [41215]	SA
Commonwealth Land - Australian Maritime Safety Authority [41263]	SA
Commonwealth Land - Australian Maritime Safety Authority [41289]	SA
Commonwealth Land - Australian Maritime Safety Authority [41288]	SA
Unknown	
Commonwealth Land - [60114]	TAS
Commonwealth Land - [60116]	TAS
Commonwealth Land - [60115]	TAS
Commonwealth Land - [60112]	TAS
Commonwealth Land - [22391]	VIC
Commonwealth Land - [22390]	VIC
Commonwealth Land - [21508]	VIC
Commonwealth Land - [21507]	VIC
Commonwealth Land - [21509]	VIC
Commonwealth Land - [21570]	VIC
Commonwealth Land - [60346]	TAS
Commonwealth Land - [21582]	VIC
Commonwealth Land - [21583]	VIC
Commonwealth Land - [21589]	VIC
Commonwealth Land - [21498]	VIC
Commonwealth Land - [21490]	VIC
Commonwealth Land - [21491]	VIC
Commonwealth Land - [21496]	VIC
Commonwealth Land - [21492]	VIC
Commonwealth Land - [60113]	TAS
Commonwealth Land - [21487]	VIC
Commonwealth Land - [21489]	VIC

Commonwealth Land Name	State
Commonwealth Land - [21488]	VIC
Commonwealth Land - [21591]	VIC
Commonwealth Land - [60111]	TAS
Commonwealth Land - [21497]	VIC
Commonwealth Land - [21590]	VIC

Commonwealth Heritage Places [[Resource Information](#)]

Name	State	Status
Historic		
Cape Northumberland Lighthouse	SA	Listed place
Cape Sorell Lighthouse	TAS	Listed place
Cape Wickham Lighthouse	TAS	Listed place
Fort Queenscliff	VIC	Listed place
Gabo Island Lighthouse	VIC	Listed place
HMAS Cerberus Central Area Group	VIC	Listed place
Montague Island Lighthouse	NSW	Listed place
Sorrento Post Office	VIC	Listed place
Swan Island Defence Precinct	VIC	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Natural		
HMAS Cerberus Marine and Coastal Area	VIC	Listed place
Point Wilson Defence Natural Area	VIC	Listed place
Swan Island and Naval Waters	VIC	Listed place

Listed Marine Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardena carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat known to occur within area
Ardena grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardena pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardena tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat may occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus capensis Cape Gannet [59569]		Breeding known to occur within area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat known to occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Breeding known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Roosting known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Breeding known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus horridus Shaggy Pipefish, Prickly Pipefish [66244]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Longsnout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Vanacampus vercoi Verco's Pipefish [66286]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Breeding known to occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Mirounga leonina Southern Elephant Seal [26]	Vulnerable	Breeding may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Ginkgo-toothed Beaked Whale, Ginkgo-toothed Whale, Ginkgo Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Foraging, feeding or related behaviour known to occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Critical Habitats		[Resource Information]
Name	Type of Presence	
Thalassarche cauta (Shy Albatross) - Albatross Island, The Mewstone, Pedra Branca	Listed Critical Habitat	

Australian Marine Parks [\[Resource Information \]](#)

Park Name	Zone & IUCN Categories
Flinders	Marine National Park Zone (IUCN II)
Murray	Marine National Park Zone (IUCN II)
Tasman Fracture	Marine National Park Zone (IUCN II)
Apollo	Multiple Use Zone (IUCN VI)
Beagle	Multiple Use Zone (IUCN VI)
Boags	Multiple Use Zone (IUCN VI)
East Gippsland	Multiple Use Zone (IUCN VI)
Franklin	Multiple Use Zone (IUCN VI)
Murray	Multiple Use Zone (IUCN VI)
Murray	Multiple Use Zone (IUCN VI)
Tasman Fracture	Multiple Use Zone (IUCN VI)
Zeehan	Multiple Use Zone (IUCN VI)
Murray	Special Purpose Zone (IUCN VI)
Nelson	Special Purpose Zone (IUCN VI)
Zeehan	Special Purpose Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Protected Area Name	Reserve Type	State
Agnes Falls S.R.	Natural Features Reserve	VIC
Aire River	Heritage River	VIC
Aire River W.R.	Natural Features Reserve	VIC
Aireys Inlet B.R.	Natural Features Reserve	VIC
Albatross Island	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Anglesea B.R.	Natural Features Reserve	VIC
Anser Island	Reference Area	VIC
Arthur-Pieman	Conservation Area	TAS
Arthur River Rd Marrawah	Conservation Covenant	TAS
Arthurs Seat	State Park	VIC
Baawang	Reference Area	VIC
Badger Box Creek	Nature Reserve	TAS
Badger River	Regional Reserve	TAS
Balcombe Creek B.R.	Natural Features Reserve	VIC
Bald Hill N.C.R	Natural Features Reserve	VIC
Bald Hills B.R.	Natural Features Reserve	VIC
Balnarring G95 B.R.	Natural Features Reserve	VIC
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barham Paradise S.R.	Natural Features Reserve	VIC
Barwon Bluff	Marine Sanctuary	VIC
Bass Pyramid	Nature Reserve	TAS
Bass River SS.R.	Natural Features Reserve	VIC
Batemans	Marine Park	NSW
Bats Ridge W.R	Nature Conservation Reserve	VIC
Baudin Rocks	Conservation Park	SA
Bay of Islands Coastal Park	Conservation Park	VIC
Beachport	Conservation Park	SA
Bellarine I109 B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Bellarine I110 B.R.	Natural Features Reserve	VIC
Bell Bird Creek	Nature Reserve	NSW
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Ben Boyd	National Park	NSW
Benedore River	Reference Area	VIC
Bennison F.F.R.	Nature Conservation Reserve	VIC
Bermagquee	Nature Reserve	NSW
Bermagui	Flora Reserve	NSW
Bernouilli	Conservation Reserve	SA
Beware Reef	Marine Sanctuary	VIC
Biamanga	National Park	NSW
Bird Island	Game Reserve	TAS
Bittern B.R.	Natural Features Reserve	VIC
Black Pyramid Rock	Nature Reserve	TAS
Blond Bay W.R.	Natural Features Reserve	VIC
Bolwarra H43 B.R.	Natural Features Reserve	VIC
Bolwarra H44 B.R.	Natural Features Reserve	VIC
Bolwarra H45 B.R.	Natural Features Reserve	VIC
Bournda	Nature Reserve	NSW
Bournda	National Park	NSW
Breamlea F.F.R.	Nature Conservation Reserve	VIC
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Broulee Island	Nature Reserve	NSW

Protected Area Name	Reserve Type	State
Buckley N.C.R.	Natural Features Reserve	VIC
Bucks Lake	Game Reserve	SA
Bunurong	Marine National Park	VIC
Bunurong Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Calder River	Reference Area	VIC
Calm Bay	State Reserve	TAS
Canunda	National Park	SA
Cape Conran Coastal Park	Conservation Park	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cape Jaffa	Rock Lobster Sanctuary	SA
Cape Liptrap Coastal Park	Conservation Park	VIC
Cape Nelson	State Park	VIC
Cape Patterson N.C.R	Natural Features Reserve	VIC
Cape Sorell	Historic Site	TAS
Cape Wickham	State Reserve	TAS
Cape Wickham	Conservation Area	TAS
Carpenter Rocks	Conservation Park	SA
Cataraqui Point	Conservation Area	TAS
Christmas Island	Nature Reserve	TAS
Churchill Island	Marine National Park	VIC
City of Melbourne Bay	Conservation Area	TAS
Colbert Ck B.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Colliers Forest Reserve	Conservation Covenant	TAS
Colliers Swamp	Conservation Area	TAS
Cone Islet	Conservation Area	TAS
Conewarre K47 SS.R.	Natural Features Reserve	VIC
Conewarre K48 SS.R.	Natural Features Reserve	VIC
Corinella B.R.	Natural Features Reserve	VIC
Corinella Cemetery B.R.	Natural Features Reserve	VIC
Corner Inlet	Marine National Park	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Councillor Island	Nature Reserve	TAS
Counsel Hill	Conservation Area	TAS
Crib Point G228 B.R.	Natural Features Reserve	VIC
Crib Point G229 B.R.	Natural Features Reserve	VIC
Croajingolong	National Park	VIC
Curdie Vale N.C.R.	Natural Features Reserve	VIC
Currie Lightkeepers Residence	Historic Site	TAS
Curtis Island	Nature Reserve	TAS
Darriman H29 B.R	Natural Features Reserve	VIC
Deen Maar	Indigenous Protected Area	VIC
Deep Lagoons	Conservation Area	TAS
Devilbend N.F.R.	Natural Features Reserve	VIC
Devils Tower	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
Dingley Dell	Conservation Park	SA
Disappointment Bay	State Reserve	TAS
Discovery Bay	Marine National Park	VIC
Discovery Bay Coastal Park	Conservation Park	VIC
Double Creek	Natural Catchment Area	VIC
Douglas Point	Conservation Park	SA
Drakes B.R.	Natural Features Reserve	VIC
Dromana B.R.	Natural Features Reserve	VIC
Drumdlemara H1 B.R	Natural Features Reserve	VIC
Drumdlemara H2 B.R	Natural Features Reserve	VIC
Drumdlemara H4 B.R	Natural Features Reserve	VIC
Dry Creek	Forest Reserve	SA
Eagle Rock	Marine Sanctuary	VIC
East Gippsland Coastal streams	Natural Catchment Area	VIC
East Moncoeur Island	Conservation Area	TAS
Edna Bowman N.C.R.	Natural Features Reserve	VIC
Eldorado	Conservation Area	TAS
Entrance Point	Reference Area	VIC
Eurobodalla	National Park	NSW
Ewens Ponds	Conservation Park	SA
Ewing Morass W.R	Natural Features Reserve	VIC
Fingal B.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Flinders G234 B.R.	Natural Features Reserve	VIC
Flinders N.F.R.	Natural Features Reserve	VIC
Fossil Beach G.R.	Natural Features Reserve	VIC
Four Mile Beach	Regional Reserve	TAS
Franklin River SS.R.	Natural Features Reserve	VIC
Fraser Island G.L.R.	Natural Features Reserve	VIC
French Island	National Park	VIC
French Island	Marine National Park	VIC
French Island (east)	Reference Area	VIC
French Island (north)	Reference Area	VIC
French Island G230 B.R	Natural Features Reserve	VIC
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC
Gentle Annie	Conservation Area	TAS
Giffard H31 B.R	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Glenelg River	Heritage River	VIC
Goose Lagoon W.R	Natural Features Reserve	VIC
Gorae B.R.	Natural Features Reserve	VIC
Grantville B.R	Natural Features Reserve	VIC
Grantville N.C.R	Natural Features Reserve	VIC
Great Otway	National Park	VIC

Protected Area Name	Reserve Type	State
Guichen Bay	Conservation Park	SA
Gulaga	National Park	NSW
Harbour Islets	Conservation Area	TAS
Hedditch Hill S.R.	Natural Features Reserve	VIC
Henderson Islets	Conservation Area	TAS
Hoddle Range F.R.	Nature Conservation Reserve	VIC
Hogan Group	Conservation Area	TAS
Hopkins Falls S.R.	Natural Features Reserve	VIC
Hunter Island	Conservation Area	TAS
Hurdy Gurdy Creek N.C.R	Natural Features Reserve	VIC
Illawong	Nature Reserve	NSW
Jack Smith Lake W.R	Natural Features Reserve	VIC
Johanna Falls S.R.	Natural Features Reserve	VIC
Johnstones Creek F.R	Nature Conservation Reserve	VIC
Kangaroo Island	Conservation Area	TAS
Kangerong N.C.R	Natural Features Reserve	VIC
Kentbruck H14 B.R	Natural Features Reserve	VIC
Kentbruck H50 B.R.	Natural Features Reserve	VIC
Kentford Forest	Conservation Area	TAS
Kentford Forest	Nature Reserve	TAS
Kentford Rd Nugara	Conservation Covenant	TAS
Kent Group	National Park	TAS
Kilcunda N.C.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Kings Run	Private Nature Reserve	TAS
Kings Run #2	Conservation Covenant	TAS
Lady Julia Percy Island W.R.	Nature Conservation Reserve	VIC
Lake Aringa W.R	Nature Conservation Reserve	VIC
Lake Coleman W.R	Natural Features Reserve	VIC
Lake Connewarre W.R	Natural Features Reserve	VIC
Lake Corringale W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Denison W.R	Natural Features Reserve	VIC
Lake Frome	Conservation Park	SA
Lake Gilleear W.R	Natural Features Reserve	VIC
Lake Robe	Game Reserve	SA
Lake St Clair	Conservation Park	SA
Lake Tyers S.P.	State Park	VIC
Latrobe B.R.	Natural Features Reserve	VIC
Lavinia	State Reserve	TAS
Lawrence Rocks W.R.	Nature Conservation Reserve	VIC
Leongatha H3 B.R.	Natural Features Reserve	VIC
Lily Lagoon	Nature Reserve	TAS
Lily Pond B.R.	Natural Features Reserve	VIC
Little Dip	Conservation Park	SA
Little Trefoil	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Lonsdale Lakes W.R	Nature Conservation Reserve	VIC
Lower Glenelg	National Park	VIC
Lower Glenelg River	Conservation Park	SA
Lower South East	Marine Park	SA
Lymwood	Conservation Covenant	TAS
Macquarie Harbour	Historic Site	TAS
Main Ridge N.C.R.	Natural Features Reserve	VIC
Mallacoota B.R.	Natural Features Reserve	VIC
Marengo N.C.R.	Nature Conservation Reserve	VIC
Marengo Reefs	Marine Sanctuary	VIC
Margaret Brock Reef	Rock Lobster Sanctuary	SA
Merri	Marine Sanctuary	VIC
Merricks Creek B.R.	Natural Features Reserve	VIC
Millwood Road	Conservation Covenant	TAS
Mimosa Rocks	National Park	NSW
Montague Island	Nature Reserve	NSW
Mornington Peninsula	National Park	VIC
Mortimers Paddock B.R.	Natural Features Reserve	VIC
Mount Dundas	Regional Reserve	TAS
Mount Heemskirk	Regional Reserve	TAS
Mount Martha N.C.R.	Natural Features Reserve	VIC
Mount Richmond	National Park	VIC
Mount Vereker Creek	Natural Catchment Area	VIC

Protected Area Name	Reserve Type	State
Mouzie B.R	Natural Features Reserve	VIC
Mouzie N.F.R	Natural Features Reserve	VIC
Muddy Lagoon	Nature Reserve	TAS
Mumbulla	Flora Reserve	NSW
Murkay Islets	Conservation Area	TAS
Murrah	Flora Reserve	NSW
Mushroom Reef	Marine Sanctuary	VIC
Nadgee	Nature Reserve	NSW
Nares Rocks	Conservation Area	TAS
Narrawong F.R.	Nature Conservation Reserve	VIC
Nelson SS.R.	Natural Features Reserve	VIC
Nene Valley	Conservation Park	SA
New Year Island	Game Reserve	TAS
New Zealand Hill F.R.	Nature Conservation Reserve	VIC
Ninety Mile Beach	Marine National Park	VIC
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
North East Islet	Nature Reserve	TAS
North Western Port N.C.R.	Natural Features Reserve	VIC
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC
Ocean Beach	Conservation Area	TAS
Olivers Creek B.R.	Natural Features Reserve	VIC
Painkalac Creek	Reference Area	VIC
Parker River	Reference Area	VIC

Protected Area Name	Reserve Type	State
Pegarah	Private Nature Reserve	TAS
Pegarah Forest	Conservation Covenant	TAS
Pegarah Rd King Island	Conservation Covenant	TAS
Penguin Island	Conservation Park	SA
Petrel Islands	Game Reserve	TAS
Phillip Island Nature Park	Other	VIC
Piccaninnie Ponds	Conservation Park	SA
Pieman River	State Reserve	TAS
Point Addis	Marine National Park	VIC
Point Danger	Marine Sanctuary	VIC
Point Hicks	Marine National Park	VIC
Point Nepean	National Park	VIC
Porky Beach	Conservation Area	TAS
Portarlington (Point Richard) F.F.R.	Nature Conservation Reserve	VIC
Port Campbell	National Park	VIC
Portland H46 B.R.	Natural Features Reserve	VIC
Portland H47 B.R.	Natural Features Reserve	VIC
Port Phillip Heads	Marine National Park	VIC
Preminghana	Indigenous Protected Area	TAS
Princetown W.R	Natural Features Reserve	VIC
Queenscliff N.F.R	Natural Features Reserve	VIC
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Rebecca Creek	Conservation Area	TAS
Red Hill South B.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Red Hut Point	Conservation Area	TAS
Red Hut Road #1	Conservation Covenant	TAS
Red Hut Road #2	Conservation Covenant	TAS
Reef Island and Bass River Mouth N.C.R	Natural Features Reserve	VIC
Reekara Road #1	Conservation Covenant	TAS
Reekara Road #2	Conservation Covenant	TAS
Reid Rocks	Nature Reserve	TAS
Rigby Island G.L.R.	Natural Features Reserve	VIC
Rivoli Bay	Rock Lobster Sanctuary	SA
Rodondo Island	Nature Reserve	TAS
Rosebud B.R.	Natural Features Reserve	VIC
Salt Lagoon, St Leonards W.R	Nature Conservation Reserve	VIC
Sandpatch	Wilderness Zone	VIC
Sartoris Rd Nugara	Conservation Covenant	TAS
Screw Creek N.C.R.	Natural Features Reserve	VIC
Seacrow Islet	Conservation Area	TAS
Sea Elephant	Conservation Area	TAS
Sea Elephant Bootlace	Conservation Covenant	TAS
Sea Elephant River	Conservation Covenant	TAS
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Seal Rocks	Conservation Area	TAS
Seal Rocks	State Reserve	TAS
Shallow Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC

Protected Area Name	Reserve Type	State
Shell Islets	Conservation Area	TAS
Slaves Bay	Conservation Area	TAS
Snowy River	Heritage River	VIC
South East Forest	National Park	NSW
Southern Kangaroo Island	Marine Park	SA
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Rd Nugara	Conservation Covenant	TAS
Southwest	National Park	TAS
Southwest	Conservation Area	TAS
Stack Island	Game Reserve	TAS
Steel Bay - Newland Backwater G.L.R.	Natural Features Reserve	VIC
Stokes Point	Conservation Area	TAS
Stony Creek (Otways)	Reference Area	VIC
Strahan Customs House	Historic Site	TAS
Sugarloaf Rock	Conservation Area	TAS
Sundown Point	State Reserve	TAS
Swan Bay - Edwards Point W.R	Nature Conservation Reserve	VIC
Tambar	Conservation Covenant	TAS
Tanja	Flora Reserve	NSW
Tarra Tarra B.R	Natural Features Reserve	VIC
Tarwin Lower F.R.	Nature Conservation Reserve	VIC
Tathams Lagoon	Conservation Area	TAS
Teepookana	Regional Reserve	TAS
Temma	Conservation Covenant	TAS

Protected Area Name	Reserve Type	State
The Arches	Marine Sanctuary	VIC
The Doughboys	Nature Reserve	TAS
The Gurdies N.C.R	Natural Features Reserve	VIC
The Lakes	National Park	VIC
Three Hummock Island	State Reserve	TAS
Tikkawoppa Plateau	Regional Reserve	TAS
Tin Mine Rd Loorana	Conservation Covenant	TAS
Tower Hill W.R	Natural Features Reserve	VIC
Trewalla H48 B.R.	Natural Features Reserve	VIC
Trewalla H49 B.R.	Natural Features Reserve	VIC
Trial Harbour	State Reserve	TAS
Tully River	Conservation Area	TAS
Twelve Apostles	Marine National Park	VIC
Tyabb B.R.	Natural Features Reserve	VIC
Tyrendarra F.R	Nature Conservation Reserve	VIC
Unnamed (No.HA1038)	Heritage Agreement	SA
Unnamed (No.HA108)	Heritage Agreement	SA
Unnamed (No.HA1166)	Heritage Agreement	SA
Unnamed (No.HA1180)	Heritage Agreement	SA
Unnamed (No.HA1361)	Heritage Agreement	SA
Unnamed (No.HA1404)	Heritage Agreement	SA
Unnamed (No.HA1457)	Heritage Agreement	SA
Unnamed (No.HA1560)	Heritage Agreement	SA
Unnamed (No.HA1571)	Heritage Agreement	SA

Protected Area Name	Reserve Type	State
Unnamed (No.HA1626)	Heritage Agreement	SA
Unnamed (No.HA177)	Heritage Agreement	SA
Unnamed (No.HA197)	Heritage Agreement	SA
Unnamed (No.HA245)	Heritage Agreement	SA
Unnamed (No.HA26)	Heritage Agreement	SA
Unnamed (No.HA354)	Heritage Agreement	SA
Unnamed (No.HA42)	Heritage Agreement	SA
Unnamed (No.HA497)	Heritage Agreement	SA
Unnamed C0293	Private Nature Reserve	VIC
Unnamed P0155	Private Nature Reserve	VIC
Unnamed P0176	Private Nature Reserve	VIC
Upper South East	Marine Park	SA
Ventnor B.R.	Natural Features Reserve	VIC
Vereker Creek	Reference Area	VIC
Waratah B.R	Natural Features Reserve	VIC
Warneet Balaka St B.R.	Natural Features Reserve	VIC
Warneet Iluka St B.R.	Natural Features Reserve	VIC
Warneet N.F.R.	Natural Features Reserve	VIC
Warra Creek	Regional Reserve	TAS
Warrengine Creek SS.R.	Natural Features Reserve	VIC
Welcome River	State Reserve	TAS
Welshpool H17 B.R	Natural Features Reserve	VIC
West Coast Range	Regional Reserve	TAS
West Moncoeur Island	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
West Point	State Reserve	TAS
Whipstick Gully N.F.R.	Natural Features Reserve	VIC
Wicks Road Nugara	Conservation Covenant	TAS
Wild Dog B.R.	Natural Features Reserve	VIC
Wild Dog Creek SS.R.	Natural Features Reserve	VIC
William Hunter F.R	Nature Conservation Reserve	VIC
Wilson's Promontory	Wilderness Zone	VIC
Wilson's Promontory	National Park	VIC
Wilson's Promontory	Marine National Park	VIC
Wilson's Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilson's Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC
Wilson's Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wongarra B.R.	Natural Features Reserve	VIC
Wonga Wonga South B.R	Natural Features Reserve	VIC
Wonthaggi G237 B.R.	Natural Features Reserve	VIC
Wonthaggi G238 B.R.	Natural Features Reserve	VIC
Wonthaggi G239 B.R.	Natural Features Reserve	VIC
Wonthaggi G240 B.R.	Natural Features Reserve	VIC
Wonthaggi G241 B.R.	Natural Features Reserve	VIC
Wonthaggi Heathlands N.C.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Woodside H26 B.R.	Natural Features Reserve	VIC
Woodside H27 B.R.	Natural Features Reserve	VIC
Woodside H28 B.R.	Natural Features Reserve	VIC
Wright Rock	Nature Reserve	TAS
Yambacoona	Conservation Covenant	TAS
Yambuk F.F.R.	Nature Conservation Reserve	VIC
Yambuk Wetlands N.C.R.	Natural Features Reserve	VIC
Yanakie F.R.	Nature Conservation Reserve	VIC
Yaringa	Marine National Park	VIC

Regional Forest Agreements

[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland RFA	Victoria
Eden RFA	New South Wales
Gippsland RFA	Victoria
Southern RFA	New South Wales
Tasmania RFA	Tasmania
West Victoria RFA	Victoria

Nationally Important Wetlands

[\[Resource Information \]](#)

Wetland Name	State
Aire River	VIC
Anderson Inlet	VIC
Benedore River	VIC
Bondi Lake	NSW

Wetland Name	State
Bungaree Lagoon	TAS
Clyde River Estuary	NSW
Coila Creek Delta	NSW
Corner Inlet	VIC
Ewens Ponds	SA
Ewing's Marsh (Morass)	VIC
Glenelg Estuary	VIC
Glenelg River	VIC
Jack Smith Lake State Game Reserve	VIC
Lake Ashwood	TAS
Lake Bantick	TAS
Lake Bunga	VIC
Lake Connewarre State Wildlife Reserve	VIC
Lake Flannigan	TAS
Lake Frome & Mullins Swamp	SA
Lake Garcia	TAS
Lake King Wetlands	VIC
Lake Tyers	VIC
Lake Victoria Wetlands	VIC
Lake Wellington Wetlands	VIC
Lavinia Nature Reserve	TAS
Long Swamp	VIC
Lower Aire River Wetlands	VIC
Lower Merri River Wetlands	VIC
Lower Snowy River Wetlands System	VIC
Mallacoota Inlet Wetlands	VIC
Merimbula Lake	NSW

Wetland Name	State
Moruya River Estuary Saltmarshes	NSW
Mud Islands	VIC
Nadgee Lake and tributary wetlands	NSW
Nargal Lake	NSW
Nelson Lagoon	NSW
Pambula Estuarine Wetlands	NSW
Pearshape Lagoon 1	TAS
Pearshape Lagoon 2	TAS
Pearshape Lagoon 3	TAS
Pearshape Lagoon 4	TAS
Piccaninnie Ponds	SA
Powlett River Mouth	VIC
Princetown Wetlands	VIC
Shallow Inlet Marine & Coastal Park	VIC
Snowy River	VIC
South East Coastal Salt Lakes	SA
Swan Bay & Swan Island	VIC
Sydenham Inlet Wetlands	VIC
Tamboon Inlet Wetlands	VIC
Thurra River	VIC
Tower Hill	VIC
Tuross River Estuary	NSW
Unnamed Wetland	TAS
Waldrons Swamp	NSW
Wallaga Lake	NSW
Wallagoot Lagoon (Wallagoot Lake)	NSW
Werribee-Avalon Area	VIC

Wetland Name	State
Western Port	VIC
Yambuk Wetlands	VIC

EPBC Act Referrals [[Resource Information](#)]

Title of referral	Reference	Referral Outcome	Assessment Status
Apollo Bay to Skenes Creek Coastal Trail	2022/09274		Assessment
Barwon Heads Road Reserve Road to Lower Duneed Road Upgrade Project	2023/09724		Completed
Bermagui Golf Club Proposed Subdivision (Stages 3-8)	2022/09242		Post-Approval
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision
Broulee Beach Estate residential development subdivision	2023/09551		Completed
Cape Winds Offshore Windfarm Geophysical, Geotechnical and Marine Studies	2023/09629		Referral Decision
Dolphin Tungsten Mine Grassy King Island	2023/09653		Referral Decision
Eurobodalla Regional Hospital	2023/09506		Completed
Gelliondale Wind Farm Project	2023/09577		Assessment
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Referral Decision
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Marine Farming Expansion, Macquarie Harbour, TAS	2012/6406		Assessment
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Nora Creina integrated golf course and tourism development, SA	2014/7249		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
Offshore Tidal Energy Facility and Submarine Cable	2008/4480		Completed
Otway Astrolabe 3D Marine Seismic Survey, Otway Basin	2012/6421		Completed
Proposed residential subdivision	2023/09632		Completed
Robbins Island Renewable Energy Park, Robbins Island, Tasmania	2017/8096		Approval
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Referral Decision
South East Australia Carbon Capture and Storage Project, Onshore and State waters	2023/09731		Referral Decision
Southern Winds Offshore Wind Project	2022/09435		Assessment
Southern Winds Offshore Wind Project Initial Marine Field Investigations	2022/09436		Completed
Spinifex Offshore Surveys	2022/09359		Completed
Victorian Renewable Energy Terminal	2023/09609		Referral Decision
Vopak Victoria Energy Terminal	2023/09507		Assessment
Controlled action			
Alberton Wind Farm, Sth Gippsland, Vic	2017/7854	Controlled Action	Post-Approval
Alston-1 petroleum exploration well, permit VIC/P44	2003/1315	Controlled Action	Post-Approval
Bald Hills Wind Farm 80 Turbines	2002/730	Controlled Action	Post-Approval
Basalt Quarry Extension (Mountainview Quarry)	2004/1329	Controlled Action	Completed
Boundary Road Quarry extension, Dromana, Vic	2018/8221	Controlled Action	Assessment Approach

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Casino Gas Field Development	2003/1295	Controlled Action	Post-Approval
City Of Greater Geelong Mosquito Control Program 2021-2030, Vic	2020/8782	Controlled Action	Further Information Request
Construction of a factory for the production of ACV's	2007/3842	Controlled Action	Completed
Crib Point to Pakenham Gas Pipeline, Vic	2018/8297	Controlled Action	Completed
Dairy Farm expansion on the Woolnorth property	2013/6710	Controlled Action	Completed
DPIPWE - Arthur-Pieman Conservation Area - off-road vehicle mitigation actions	2017/8038	Controlled Action	Completed
Establishment of plantation for use of effluent water	2003/1063	Controlled Action	Completed
Extension of Mountain View basalt quarry by 490 hectares (Stage 2)	2004/1590	Controlled Action	Post-Approval
Gas Import Facility, Crib Point, Vic	2018/8298	Controlled Action	Completed
Geelong Salt Fields Urban Renewal Project	2012/6630	Controlled Action	Assessment Approach
Gippsland Regional Port Project	2020/8667	Controlled Action	Assessment Approach
Glenelg Dolomite Quarry	2017/8021	Controlled Action	Post-Approval
Golden Beach Gas Project	2019/8513	Controlled Action	Post-Approval
Green Point Wind Farm	2001/529	Controlled Action	Post-Approval
Heemskirk Windfarm Development	2002/678	Controlled Action	Completed
Installation of replacement crude-condensate pipeline, Vic	2014/7202	Controlled Action	Post-Approval
Kentbruck Green Power Hub, Vic	2019/8510	Controlled Action	Assessment Approach
Lonsdale Golf Club Redevelopment	2003/969	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
<u>Controlled action</u>			
Lorne Golf Course redevelopment	2004/1513	Controlled Action	Post-Approval
Maintenance Dredging of Toora Boat Ramp Channel	2008/4376	Controlled Action	Completed
Mosquito Control	2005/2132	Controlled Action	Post-Approval
Otway Development	2002/621	Controlled Action	Post-Approval
Pacific Hydro (Portland) Wind Farm SW Victoria	2000/18	Controlled Action	Post-Approval
Pelican Point residential subdivision	2006/2529	Controlled Action	Completed
Port Phillip Bay Channel Deepening	2002/576	Controlled Action	Post-Approval
Redevelopment of post office and construction of dwellings	2007/3639	Controlled Action	Completed
Replacement of Existing Bayles Bridges 1 and 2 on Koo Wee Rup - Longwarry Road over Yallock Creek	2005/1990	Controlled Action	Post-Approval
Residential and Golf Course Development Project	2003/1144	Controlled Action	Post-Approval
Residential Estate, 251-319 Melaluka Rd	2007/3308	Controlled Action	Post-Approval
Residential Subdivision & Infrastructure Parish of Belfast	2005/1954	Controlled Action	Completed
Residential Subdivision and Stormwater Enhancements for land west of Ash Road	2012/6544	Controlled Action	Completed
SA Offshore Windfarm	2021/9028	Controlled Action	Assessment Approach
Schomberg 3D Marine Seismic Survey	2007/3754	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Strike Oil Gas Exploration Well, Otway Basin (VIC/P44)	2000/97	Controlled Action	Completed
Tarkine Forest Drive Road Upgrade	2011/6210	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
The Tarkine Road Project	2009/5169	Controlled Action	Completed
Thomson River Mercury Recovery Project	2010/5734	Controlled Action	Completed
Twelve Apostles Saddle Lookout	2019/8571	Controlled Action	Post-Approval
Upgrade and expansion of existing Yaringa Boat Harbour	2011/6014	Controlled Action	Post-Approval
VIC Offshore Windfarm	2021/8966	Controlled Action	Assessment Approach
VICP61 2D Marine Seismic Survey	2008/4075	Controlled Action	Completed
Victorian Desalination Project, Bass Coast	2008/3948	Controlled Action	Post-Approval
Viva Energy Gas Terminal Project	2020/8838	Controlled Action	Assessment Approach
White Rock Wind Farm	2003/986	Controlled Action	Completed
Windfarm	2003/1109	Controlled Action	Completed
Wind Farm Construction	2000/12	Controlled Action	Post-Approval
Wind Turbines	2001/439	Controlled Action	Completed
Wyndham Cove marina and residential development	2004/1331	Controlled Action	Post-Approval
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic survey, Petroleum Exploration Permit Area T/36P	2004/1787	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
accomodation units and associated administration and recreational facilities	2001/430	Not Controlled Action	Completed
Acquisition of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Airey Inlet water reclamation plant to Anglesea sewerage system	2006/2539	Not Controlled Action	Completed
Allendale wind farm	2007/3549	Not Controlled Action	Completed
Alteration of Grass Maintenance Regime within Powling St Wetlands	2012/6527	Not Controlled Action	Completed
Amrit-1 exploration well	2004/1572	Not Controlled Action	Completed
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Anglesea Mine South Wall Vegetation removal, Anglesea, Vic	2017/8060	Not Controlled Action	Completed
Apollo Bay Water Storage Basin, VIC	2012/6484	Not Controlled Action	Completed
Aquaculture facility for rainbow trout and yabbies and recreational facilities	2002/822	Not Controlled Action	Completed
Barwon Heads Rd gas pipeline installation	2006/2769	Not Controlled Action	Completed
Barwon Heads Stormwater Outfall upgrade, Victoria	2016/7650	Not Controlled Action	Completed
Barwon River Parkland Initiative, Tait's Point, Stages 1 and 2	2010/5437	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Bluff Heights Estate Stages 2 to 4	2003/1047	Not Controlled Action	Completed
Boneo Park Equestrian Centre	2008/4639	Not Controlled Action	Completed
Cape Jaffa anchorage marina and residences	2004/1816	Not Controlled Action	Completed
Capture of Juvenile Tasmanian Devils for Conservation Purposes	2007/3261	Not Controlled Action	Completed
Capture of Tasmanian Devils from Disease-Free Areas	2007/3883	Not Controlled Action	Completed
Caswell Street - Moruya East	2020/8781	Not Controlled Action	Completed
CO2 geosequestration - Otway Basin Pilot Project	2006/2699	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Construct a Recycled Water Pipeline from Somers Treatment Plant to Blue Scope S	2009/4982	Not Controlled Action	Completed
Construction and operation of Barwon Water biosolids treatment facility	2008/4345	Not Controlled Action	Completed
Construction of a Dwelling	2011/6160	Not Controlled Action	Completed
Construction of a flexi mat boat ramp	2011/5838	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Construction of Barwon Heads Bridge	2005/2375	Not Controlled Action	Completed
Construction of Infrastructure to Extract, Treat & Transfer Groundwater to Wurde	2008/4104	Not Controlled Action	Completed
Construction of Overtaking Lanes on Great Ocean Rd	2008/4044	Not Controlled Action	Completed
construction of pump station for pump diversion from the Barham River	2003/1242	Not Controlled Action	Completed
Construction of the Edgars Road Extension, from Childs Road, Lalor to Cooper Street, Epping	2003/1135	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Cowes Primary School Gymnasium	2020/8683	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Pt Nepean Quarantine Station (former) National Centre for Coasts and Climate	2008/4653	Not Controlled Action	Completed
development of retirement resort	2004/1828	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Divestment of Norris Barracks	2003/963	Not Controlled Action	Completed
DOFA weed eradication program at Gooroyaroo NSW	2003/1270	Not Controlled Action	Completed
Dredging of Tuross Lake channel and depositon of spoil in lake	2004/1554	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Callister-1 exploration well in VIC/P51	2004/1633	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Eden Wind Farm	2011/6037	Not Controlled Action	Completed
Eight Mile Creek Drainage Works, Peacocks Road, Eight Mile Creek, SA	2014/7170	Not Controlled Action	Completed
Enterprise 1 Exploration Drilling Program, near Port Campbell, Vic	2019/8438	Not Controlled Action	Completed
Erosion Trials - planting and pile program of >300 mangroves	2006/2856	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Establishment of a 6 turbine windfarm near Wonthaggi	2002/820	Not Controlled Action	Completed
Expansion of the Candowie Reservoir and associated revegetation works	2012/6317	Not Controlled Action	Completed
Exploration drilling for liquid/gaseous hydrocarbons	2004/1681	Not Controlled Action	Completed
Exploration Drilling Well Trefoil-1	2003/1058	Not Controlled Action	Completed
Extension of Mountain View basalt quarry by 113 hectares (stage one)	2004/1591	Not Controlled Action	Completed
Fabrication and Spooling of Pipe Strings at Crib Point	2008/4127	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Flinders Backlog Sewer Project	2005/2275	Not Controlled Action	Completed
Floating Observation Platform, Tooradin Channel	2006/2766	Not Controlled Action	Completed
Gas Field Development	2006/2635	Not Controlled Action	Completed
Gas Fields Development	2011/5879	Not Controlled Action	Completed
Gas Pipeline Installation	2005/2495	Not Controlled Action	Completed
Geelong Bypass Sections 1 & 2	2005/2097	Not Controlled Action	Completed
George Bass Drive Lilli Pilli Road Realignment	2021/8876	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Gleneig Spiny Crayfish Habitat Rehabilitation	2011/6164	Not Controlled Action	Completed
Golflinks Road Residential Development & Water Storage Facility at Barwon Heads	2004/1793	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Grevillea infecunda tip cuttings and soil samples	2005/1979	Not Controlled Action	Completed
Halladale and Speculant Gas Pipeline Project, North of Port Campbell, Vic	2015/7551	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Henry-1 Exploration Well, Petroleum Permit Area VIC/P44	2005/2147	Not Controlled Action	Completed
Huxley Hill Wind Farm expansion	2005/2499	Not Controlled Action	Completed
Huxley Hill Wind Farm Expansion	2002/570	Not Controlled Action	Completed
Illuka Residential Estate	2007/3224	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Installation of a 35 metre telecommunications facility at Jirrahlinga Animal San	2003/1151	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed
Kelly Swamp Boardwalk Construction	2010/5371	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Kongorong Wind Farm	2002/568	Not Controlled Action	Completed
Laslett Wind Farm	2007/3550	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Lot 5 Pelican Point Road, Pelican Point SA - Proposed New Dwelling	2021/9011	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Maintenance and priority works to heritage buildings at Point Nepean Quarantine	2006/3151	Not Controlled Action	Completed
Maintenance dredging of Yaringa Channel	2004/1360	Not Controlled Action	Completed
Maintenance Dredging South Channel 2012	2011/6198	Not Controlled Action	Completed
Maintenance of Access Track and Weed Removal	2009/4973	Not Controlled Action	Completed
Maintenance works at Barwon Heads Bridge	2003/1199	Not Controlled Action	Completed
Marine and Freshwater Resources Institute (MAFRI) Facility	2000/121	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Merricks Beach Backlog Sewer Project	2010/5300	Not Controlled Action	Completed
Millwood Road Gravel Quarry	2002/602	Not Controlled Action	Completed
Milton/Ulladulla Sewerage Scheme	2001/251	Not Controlled Action	Completed
Minerva Cut Back Project, Vic	2017/8036	Not Controlled Action	Completed
Multi-species Aquaculture Enterprise	2001/404	Not Controlled Action	Completed
Newfield wind farm	2007/3226	Not Controlled Action	Completed
Newhaven Yacht Squadron marina extension	2004/1450	Not Controlled Action	Completed
New Water Infrastructure Upgrade, Grassy Dam, King Island	2013/6882	Not Controlled Action	Completed
Nirranda South Wind Farm Pty Ltd	2002/763	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Ocean Grove rising main 2 upgrade	2009/4978	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Ocean Grove Rising Main 2 Upgrade (OGRM2) - East Section & River Crossing	2010/5508	Not Controlled Action	Completed
Oceanlinx South Australia 1mW Greenwave Project	2012/6528	Not Controlled Action	Completed
Offshore exploration drilling within permit area VIC/P 37(v)	2004/1466	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed
Optic fibre cable installation - San Remo to Cowes	2005/2386	Not Controlled Action	Completed
Piccaninnie Ponds flow path restoration project, SA	2013/6711	Not Controlled Action	Completed
Pipeline easement regrowth removal	2011/5817	Not Controlled Action	Completed
Point Cooke Coastal Trail	2001/324	Not Controlled Action	Completed
Point Nepean Quarantine Station (former)/Restoration of Medical Superintendent's	2006/3149	Not Controlled Action	Completed
Port Campbell Headland Walking Trail Realignment	2012/6676	Not Controlled Action	Completed
Portland Landfill Borehole Installation, Vic	2017/7886	Not Controlled Action	Completed
Port Phillip Channel Deepening Project - Trial Dredge Program	2005/2164	Not Controlled Action	Completed
Port Welshpool Harbour Dredging	2007/3521	Not Controlled Action	Completed
Proposed replacement of existing road culvert	2013/7077	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Queenscliff Harbour Redevelopment	2004/1352	Not Controlled Action	Completed
Railway Bridge (H0151) Partial Demolition, Merri River	2010/5534	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Redevelopment Project to Upgrade and Extend the Portland Trawler Wharf	2008/4317	Not Controlled Action	Completed
refurbishment works to Badcoe Hall, Pt Neapean Quarantine Station (former)	2006/3152	Not Controlled Action	Completed
Rehabilitation of Lake Connewarre State Game Reserve	2002/708	Not Controlled Action	Completed
Remedial Works to the Swan Island Bridge	2003/1129	Not Controlled Action	Completed
Remote power generation project	2005/2287	Not Controlled Action	Completed
Removal of AMSA Structure	2003/1131	Not Controlled Action	Completed
Removal of Strzelecki Gum as part of the Regional Fast Rail Project	2006/2936	Not Controlled Action	Completed
Replacement of sewer pipelines	2002/623	Not Controlled Action	Completed
Residential/Resort/Golf Course development	2002/907	Not Controlled Action	Completed
Residential Development, 409 The Esplanade, St Leonards	2006/2950	Not Controlled Action	Completed
Residential Dwelling	2004/1896	Not Controlled Action	Completed
Restricted Recreation Facility - soccer pitch, stadium and associated parking	2006/3034	Not Controlled Action	Completed
Robe Golf Club - Golf Course Extension, SA	2017/7928	Not Controlled Action	Completed
Robe Golf Course, Allotment 2, Davenport Street, Robe, SA	2014/7178	Not Controlled Action	Completed
Ryan Corner Wind Farm	2005/2142	Not Controlled Action	Completed
Ship to Ship Crude Oil Lightering	2001/271	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Sparrovale Wetland stormwater management, Armstrong Creek and Charlemont, VIC	2018/8375	Not Controlled Action	Completed
Spikey Beach 1, West Triton Drilling Program, Bass Basin Permit T/38P	2007/3914	Not Controlled Action	Completed
Stage 1 residential subdivision, Anna Catherine Drive	2005/1992	Not Controlled Action	Completed
St Quentin Consulting Pty Ltd /Residential development/305 Great Ocean Road, Jan Juc/VIC/Development	2014/7184	Not Controlled Action	Completed
Telstra optic fibre cable across Bass Strait - Sub bottom profiler Surve	2002/779	Not Controlled Action	Completed
Tenby Point Sewerage Pipeline	2001/406	Not Controlled Action	Completed
To construct a shared trail within the Arthurs Seat Road, road reserve south side from Mornington Fl	2004/1565	Not Controlled Action	Completed
Torquay Sewerage Strategy - pipe replacement between Torquay and the Black Rock	2004/1704	Not Controlled Action	Completed
To undertake maintenance dredging of the Toora Boat Ramp Channel, VIC	2014/7225	Not Controlled Action	Completed
Track construction - Great Ocean Walk	2002/793	Not Controlled Action	Completed
Transfer of 90ha Point Nepean Quarantine Station from Commonwealth to Victorian	2008/4521	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Upgrade and Repairs to Flinders Pier	2008/4331	Not Controlled Action	Completed
Upgrade of existing access track	2011/5933	Not Controlled Action	Completed
Upgrade of the existing Thornhill St Sewer Pump Station	2010/5618	Not Controlled Action	Completed
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
VIC-P44 Stage 2 Gas Field Development	2007/3767	Not Controlled Action	Completed
Victorian Generator Project	2005/1984	Not Controlled Action	Completed
Wastewater Treatment System Upgrade	2004/1420	Not Controlled Action	Completed
Water capture to restore wetlands	2007/3223	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
West Triton Drilling Program - Otway Basin	2007/3909	Not Controlled Action	Completed
Wind Farm	2002/691	Not Controlled Action	Completed
Wind Farm Construction and Operation	2001/471	Not Controlled Action	Completed
Woakwine Wind Farm, SA	2011/6070	Not Controlled Action	Completed
Wooralla Drive pump station, pipeline and associated works	2005/2450	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Moonlight Head' 3D seismic survey, VIC/P38(V), VIC/P43 and VIC/RL8	2005/2236	Not Controlled Action (Particular Manner)	Post-Approval
2D & 3D seismic survey T/39P	2005/2237	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey	2005/2295	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey, EPP33	2004/1794	Not Controlled Action (Particular Manner)	Post-Approval
2D Marine Seismic Survey in Permit Areas T/32P and T/33P	2002/845	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		(Particular Manner)	
2D Seismic Survey	2003/1214	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/3962	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4131	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey, Petroleum Exploration Permit Area EPP27	2006/2776	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey in VIC/P50 and VIC/P46	2004/1810	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey VIC/P50	2005/2313	Not Controlled Action (Particular Manner)	Post-Approval
2D Siesmic Marine Survey	2008/4074	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
3D marine seismic survey near King Island	2004/1461	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey within Torquay Sub-basin off sthn Victoria	2012/6256	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic program VIC/P38(v), VIC/P43 and VIC/RL8	2003/1137	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey	2008/4528	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Astrolabe 3D Marine Seismic Survey	2011/6048	Not Controlled Action (Particular Manner)	Post-Approval
Barwon Heads Rising Main No.11 Sewerage Pipe Upgrade	2008/4091	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Bass Coast, South Gippsland and Cardinia Shires, Gas Pipeline and Lang Lang Offtake and City Gate St	2006/2867	Not Controlled Action (Particular Manner)	Post-Approval
Benbows Paddock residential development, Cape Bridgewater	2007/3247	Not Controlled Action (Particular Manner)	Post-Approval
Bernoulli 3D Seismic Survey	2006/3053	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
BHPBilliton Otway 3D Seismic Survey	2007/3443	Not Controlled Action (Particular Manner)	Post-Approval
Bitumen Storage Facility	2007/3676	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Collection of cast bull kelp	2002/813	Not Controlled Action (Particular Manner)	Post-Approval
construction of a 14km , 33kV distribution line, including connection to the Lake Bonney Central win	2003/1108	Not Controlled Action (Particular Manner)	Post-Approval
Construction of bridge across Barwon River	2006/2947	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construct private dwelling	2008/4234	Not Controlled Action (Particular Manner)	Post-Approval
Construct single dwelling	2008/4504	Not Controlled Action (Particular Manner)	Post-Approval
Controlled Burn, Understorey Clearance and Removal of UXO	2003/1030	Not Controlled Action (Particular Manner)	Post-Approval
Corio Bay Channel Safety Adjustment Program	2011/6208	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Deepwater Sorell Basin 2001 Non-Exclusive 2D Seismic Survey	2001/156	Not Controlled Action (Particular Manner)	Post-Approval
development of retirement village, Bellarine Lakes Golf Course, Bellarine Hwy	2006/3015	Not Controlled Action (Particular Manner)	Post-Approval
Drainage, Trenching & Cable Laying as Part of the Regional Fast Rail Project	2003/1133	Not Controlled Action (Particular Manner)	Post-Approval
Drill and Profile Exploration Well Somerset 1, License Area T34P	2009/5037	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Enterprise Three-dimensional Transition Zone Seismic Survey, Victoria	2016/7800	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Fuelbreak construction	2009/4915	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Geelong Bypass Section 3	2005/2099	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Geographe-A gas exploration well	2000/82	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Granville Wind Farm, TAS	2012/6585	Not Controlled Action (Particular Manner)	Post-Approval
Hydrocarbon exploration wells	2003/1062	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Installation of a 17x6m floating pontoon adjacent to existing boat ramp	2009/4842	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
La Bella 3D Marine Seismic Survey, Otway Basin, VIC	2012/6683	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Lakes Oil 3D Seismic Survey	2002/768	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness PT 2	2006/3044	Not Controlled Action (Particular Manner)	Post-Approval
Luxury Cruise on the Gordon River, Tasmanian Wilderness WHA	2004/1846	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program	2009/4953	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging Program 2012-21 in Port of Melbourne	2012/6332	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Origin Energy Silvereye-1 Exploration Drilling Programme	2010/5702	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
OTE10 2D Marine Seismic Survey	2009/5223	Not Controlled Action (Particular Manner)	Post-Approval
Otway Basin Exploration Drilling Campaign, Vic	2011/6125	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Point Wilson Explosives Area Waterside Infrastructure Remediation	2012/6376	Not Controlled Action (Particular Manner)	Post-Approval
Remove silt build up on existing swales around the perimeter of the Three Hummo	2010/5676	Not Controlled Action (Particular Manner)	Post-Approval
Residential Development and Associated Infrastructure at Port Fairy	2012/6687	Not Controlled Action (Particular Manner)	Post-Approval
Rockhopper-1 and Trefoil-2 Exploration Drilling in Permit Area T/18P	2009/4776	Not Controlled Action (Particular Manner)	Post-Approval
Santos 2D Seismic Survey VIC/P44 & VIC/P51	2003/1213	Not Controlled Action (Particular Manner)	Post-Approval
Santos Otway 3d Seismic VIC/P44	2007/3367	Not Controlled Action (Particular Manner)	Post-Approval
Schomberg 3D Marine Seismic survey	2007/3868	Not Controlled Action (Particular Manner)	Post-Approval
SEA Gas Project transmission pipeline	2001/513	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey in Petroleum Permit Area EPP27	2002/648	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey VIC-P46	2002/826	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station construct gas pipeline and associated infrastructure	2009/5089	Not Controlled Action (Particular Manner)	Post-Approval
Shaw River Power Station Project - Water Supply Pipeline	2009/5091	Not Controlled Action (Particular Manner)	Post-Approval
Shearwater 2D and 3D marine seismic survey	2005/2180	Not Controlled Action (Particular Manner)	Post-Approval
Silvereye 3D Seismic Survey	2007/3551	Not Controlled Action (Particular Manner)	Post-Approval
Soil and Organic Recycling Facility	2005/2216	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Gas Pipeline Project	2002/619	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins T/35P and T/36P 3D Seismic Surveys	2007/3817	Not Controlled Action (Particular Manner)	Post-Approval
Speculant 3D Transition Zone Seismic Survey	2010/5558	Not Controlled Action (Particular Manner)	Post-Approval
Strike Oil NL Seismic Surveys	2000/107	Not Controlled Action (Particular Manner)	Post-Approval
supersonic missile launch facility	2000/120	Not Controlled Action (Particular Manner)	Post-Approval
Surface Geochemical Exploration Program, TAS	2010/5780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, Vic	2012/6565	Not Controlled Action (Particular Manner)	Post-Approval
Thylacine-A Exploration Well	2000/81	Not Controlled Action (Particular Manner)	Post-Approval
Torquay Sub-basin (VIC/P62) OTE12-3D Seismic Survey	2012/6655	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Undertake a three dimensional marine seismic survey	2010/5700	Not Controlled Action (Particular Manner)	Post-Approval
Upgrade of Arthur River Road	2003/930	Not Controlled Action (Particular Manner)	Post-Approval
Vegetation clearance and residential subdivision near Mt Gambier	2004/1370	Not Controlled Action (Particular Manner)	Post-Approval
Vic/P37(v) and Vic/P44 3D marine seismic survey	2003/1102	Not Controlled Action (Particular Manner)	Post-Approval
VIC P44 Gas Exploration Wells	2002/662	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 2D seismic survey	2002/811	Not Controlled Action (Particular Manner)	Post-Approval
Vic-P51 and Vic-P52 3D seismic survey	2002/799	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Wolseley 3D seismic acquisition survey	2010/5703	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
2D & 3D Seismic Surveys - Permit Area - VIC/P50	2008/4517	Referral Decision	Completed
2D Seismic Survey	2008/3978	Referral Decision	Completed
3D Marine Seismic Survey	2011/6156	Referral Decision	Completed
3D Seismic Survey	2008/4014	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
8 Lot Industrial Subdivision	2008/4527	Referral Decision	Completed
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alteration Reconstruction Restoration and Repairs to Buildings	2008/4179	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Holloman 2010 Vic/P60 3D Seismic Acquisition Survey Program	2009/5251	Referral Decision	Completed
Kelly Channel Discharge, Macquarie Harbour, Tasmania	2017/8057	Referral Decision	Completed
Land clearing for stock grazing	2005/2176	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Portland Wave Energy Project	2008/3946	Referral Decision	Completed
Residential Development Elizabeth Avenue, Rosebud West, VIC	2015/7603	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
The Enterprise 3D Seismic Acquisition Survey, Otway Basin, VIC	2012/6545	Referral Decision	Completed
Upgrade of Corringale Road	2009/4825	Referral Decision	Completed
Upgrade of Services Infrastructure Point Nepean Quarantine Station	2008/4591	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
VICP61 2D Marine Seismic Survey	2008/3975	Referral Decision	Completed
Wind Farm	2001/139	Referral Decision	Completed
Wolseley 3D Seismic Acquisition Survey in Permit T/32P	2010/5291	Referral Decision	Completed
Works to the buildings and surrounds at the former Point Nepean Quarantine Stati	2008/4156	Referral Decision	Completed

Key Ecological Features

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Ancient coastline at 90-120m depth	South-west
Big Horseshoe Canyon	South-east
Bonney Coast Upwelling	South-east
Canyons on the eastern continental slope	Temperate east
Kangaroo Island Pool, canyons and adjacent shelf break, and Eyre Peninsula upwellings	South-west
Shelf rocky reefs	Temperate east
Upwelling East of Eden	South-east
West Tasmania Canyons	South-east

Biologically Important Areas

[[Resource Information](#)]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Seabirds		
Ardena carneipes		
Flesh-footed Shearwater [82404]	Foraging	Known to occur
Ardena grisea		
Sooty Shearwater [82651]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Ardena grisea Sooty Shearwater [82651]	Foraging	Likely to occur
Ardena grisea Sooty Shearwater [82651]	Foraging	Known to occur
Ardena pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardena pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardena tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Ardena tenuirostris Short-tailed Shearwater [82652]	Foraging (in high numbers)	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Likely to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Hydroprogne caspia Caspian Tern [808]	Foraging (provisioning young)	Known to occur

Scientific Name	Behaviour	Presence
Larus pacificus Pacific Gull [811]	Foraging	Known to occur
Macronectes giganteus Southern Giant Petrel [1060]	Foraging	Known to occur
Macronectes halli Northern Giant Petrel [1061]	Foraging	Known to occur
Morus serrator Australasian Gannet [1020]	Aggregation	Known to occur
Morus serrator Australasian Gannet [1020]	Foraging	Known to occur
Oceanites oceanites Wilson's Storm Petrel [1034]	Migration	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelagodroma marina White-faced Storm petrel [1016]	Foraging (in high numbers)	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Likely to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Breeding	Known to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Sternula nereis Fairy Tern [82949]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Breeding	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche cauta steadi White-capped Albatross [82344]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Likely to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Thalasseus bergii Crested Tern [83000]	Breeding	Known to occur
Thalasseus bergii Crested Tern [83000]	Foraging	Likely to occur

Scientific Name	Behaviour	Presence
Seals		
Neophoca cinerea Australian Sea Lion [22]	Foraging (male)	Known to occur
Neophoca cinerea Australian Sea Lion [22]	Foraging (male and female)	Known to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Migration	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution	Likely to occur
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur
Carcharodon carcharias White Shark [64470]	Distribution (low density)	Likely to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Carcharodon carcharias White Shark [64470]	Known distribution	Known to occur
Whales		
Balaenoptera musculus brevipinna Pygmy Blue Whale [81317]	Distribution	Known to occur
Balaenoptera musculus brevipinna Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevipinna Pygmy Blue Whale [81317]	Foraging (abundant food source)	Known to occur

Scientific Name	Behaviour	Presence
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging (annual high use area)	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur
Physeter macrocephalus Sperm Whale [59]	Foraging likely (abundant food source)	Known to occur

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	
Gippsland	Gippsland Basin	BA website	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

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APPENDIX C CONSULTATION ARTIFACTS

Section 24(b) of the Environment Regulations requires that an environment plan contains a report on all consultations, under section 25, of any relevant person by the titleholder. This report must include the following:

- A summary of each response, and
- An assessment of the merits of objections and claims regarding adverse impacts of activities proposed, and
- A statement of ConocoPhillips Australia's response as titleholder to objections or claims.

Appendix C1: Consultation Report

- The relevant person/organisation ID (that did not request information be maintained as confidential)
 - Their functions, interests, or activities
- Communications
- Summary of each response

Appendix C2: Objections or claims under section 24

- Relevant person ID (Stakeholder ID) (that did not request information be maintained as confidential)
- Objection/claim
- Assessment of merit
- Summary of feedback and response, and measures adopted

Appendix C3: Supplementary Evidence

- In further support of the regulatory requirements, ConocoPhillips Australia has undertaken additional efforts and methods to reach relevant person in the community and raise awareness of the ability to self-identify through various mediums.
- Evidence that is associated with multiple people such as project updates.

Appendix C4: First Nations Consultation

- Communal interest facilitated a tailored, fit-for-purpose method of consultation. Which was adopted to reasonably reflect the characteristics of the interests affected by the proposed activity.

Appendix C5: Commercial Fishers Consultation

- Communal interest facilitated a tailored, fit-for-purpose method of consultation. Which was adopted to reasonably reflect the characteristics of the interests affected by the proposed activity.

Appendix C6: Public Comment Report

- Overview of the process applied to assessing and responding to public comments.

Appendix C is provided as a separate document.

APPENDIX D SENSITIVE INFORMATION REPORT

Appendix D: Sensitive Information Part (24(b)(iv))

- To comply with section 26(8) of the OPGGS(E)R, the full text of all responses by relevant individuals engaged under section 25 and any other sensitive information (if applicable) must be included in a sensitive information report.
- This report satisfies the remainder of section 24 and section 26(8) by containing full text responses by relevant persons and any additional sensitive information. This report will not be published.

Appendix D provided as a separate document to NOPSEMA only.

APPENDIX E OIL SPILL MODELLING REPORTS

CONOCOPHILLIPS EXPLORATION PERMIT T/49P MARINE DIESEL SPILL MODELLING

Report

MAQ1155J
Final
28 August 2023

REPORT

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Final	Issued to Client	[REDACTED]	[REDACTED]	[REDACTED]	28 August 2023

Approval for issue

[REDACTED]	[REDACTED]	28 August 2023
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TERMS AND ABBREVIATIONS

Actionable oil	Oil which is thick enough for the effective use of mitigation strategies
AMSA	Australian Maritime Safety Authority
API	American Petroleum Institute gravity. A measure of how heavy or light a petroleum liquid is compared to water.
Bonn Agreement	An agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, 1983, includes: Governments of the Kingdom of Belgium, the Kingdom of Denmark, the French Republic, the Federal Republic of Germany, the Republic of Ireland, the Kingdom of the Netherlands, the Kingdom of Norway, the Kingdom of Sweden, the United Kingdom of Great Britain and Northern Ireland and the European Union.
BP	Boiling point. The temperature at which the vapor pressure of the liquid is equal to the pressure exerted on it by the surrounding atmosphere
BTEX	Benzene, toluene, ethylbenzene, and xylenes
Decay	The process where oil components are changed either chemically or biologically (biodegradation) to another compound. It includes breakdown to simpler organic carbon compounds by bacteria and other organisms, photo-oxidation by solar energy, and other chemical reactions.
Deterministic (single) spill modelling	Oil spill modelling involving a computer simulation of a single hypothetical oil spill event subject to a single sequence of wind, current and other sea conditions over time. Single oil spill modelling, also referred to as “deterministic modelling” provides a simulation of one possible outcome of a given spill scenario, subject to the metocean conditions that are imposed. Single oil spill modelling is commonly used to consider the fate and effects of ‘worst-case’ oil spill scenarios that are carefully selected in consideration of the nature and scale of the offshore petroleum activity and the local environment (NOPSEMA, 2017). Because the outcomes of a single oil spill simulation can only represent the outcome of that scenario under one sequence of metocean conditions, worst-case conditions are often identified from stochastic modelling. It is impossible to calculate the likelihood of any outcome from a single oil spill simulation. Single oil spill modelling is generally used for response planning, preparedness planning and for supporting oil spill response operations in the event of an actual spill
Dynamic viscosity	The dynamic viscosity of a fluid expresses its resistance to shearing flows, where adjacent layers move parallel to each other with different speeds.
Floating oil exposure	Contact by floating oil on the sea surface at concentrations equal to or exceeding defined threshold concentrations. The consequence will vary depending on the threshold and the receptors
GODAE	Global Ocean Data Assimilation Experiment
HYCOM	Hybrid Coordinate Ocean Model. A data-assimilative, three-dimensional ocean model
HYDROMAP	Advanced ocean/coastal tidal model used to predict tidal water levels, current speed and current direction.
ITOPF	International Tanker Owners Pollution Federation Limited
MAHs	Monoaromatic hydrocarbons
MMA	Marine Management Area
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
PAH	Polynuclear aromatic hydrocarbons
Pour point	The pour point of a liquid is the temperature below which the liquid loses its flow characteristics
Ramsar site	A site listed under the Ramsar Convention on wetlands which is an international intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.

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Shoreline accumulation	Arrival of oil at or near shorelines at on-water concentrations equal to or exceeding defined threshold concentrations. Shoreline contact is judged for floating oil arriving within a 2 km buffer zone from any shoreline as a conservative measure
SIMAP	Spill Impact Model Application Package. SIMAP is designed to simulate the fate and effects of spilled hydrocarbons for surface or subsea releases
Stochastic (multiple) spill modelling	Stochastic oil spill modelling is created by overlaying and statistically analysing the outcomes of many single oil-spill simulations of a defined spill scenario, where each simulation was subject to a different sequence of metocean conditions, selected objectively (typically by random selection) from a long sequence of historic conditions for the study area. Analysis of this larger set of simulations provides a more accurate indication of the environment that maybe affected (EMBA) and indicates which locations are more likely to be affected (as well as other statistics). Stochastic oil spill modelling avoids biases that affect single oil spill modelling (due to the reliance on only one possible sequence of conditions). However, when interpreting stochastic modelling, which is based on a wide range of potential conditions that might happen to occur, it is essential to understand that calculations will encompass a much larger area than could be affected in any single spill event, where a more limited set of conditions will occur. Consequently, it is misleading to imply that the region derived from stochastic modelling indicate the outcomes expected from a single spill event (NOPSEMA, 2017) Stochastic modelling is generally used for risk assessment and preparedness planning by indicating locations that could be exposed and may require response or subsequent impact assessment
World Ocean Atlas	A collection of objectively analysed quality controlled physicochemical parameters (e.g. temperature, salinity, oxygen, phosphate, silicate, and nitrate) based on profile data from the World Ocean Database established by NOAA's National Centers for Environmental Information (NCEI)

EXECUTIVE SUMMARY

Background

ConocoPhillips Australia SH1 Pty Ltd (ConocoPhillips) is considering an exploration drilling campaign in Permit T/49P in Commonwealth waters. The closest points of the permit area are 23.5 km from the west coast of King Island and 26 km from the Victorian coast. Water depths in the permit area range from 70 m to 1,000 m, with approximately 90% of the survey area being in water depths less than 150 m.

To support the environmental approvals, an additional oil spill modelling study was undertaken to assess the potential exposure from a 350 m³ release of Marine Diesel Oil (MDO) over 6 hours due to a loss of containment following a vessel collision. The oil spill modelling used the same three locations as the recent subsea loss of well control (LOWC) study.

The study assessed the potential risk of exposure to the surrounding waters and shorelines for two seasons, summer months (October to March) and winter conditions (April to September). This approach assists with identifying the environmental values and sensitive regions/receptors that would be at risk of exposure on a seasonal basis, given the dominant winds and water currents that vary among the seasons.

One of the purposes of the modelling is to define the 'outer boundaries' of the environment that may be affected (EMBA) in the unlikely event of a hydrocarbon release scenario. Therefore, the modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

Methodology

The modelling study was carried out in stages. Firstly, a 10-year current dataset (2010 – 2019) that includes the combined influence of large-scale ocean and nearshore tidal currents were prepared. Secondly, the currents, local winds and detailed hydrocarbon characteristics were used as inputs in the three-dimensional oil spill model (SIMAP) to simulate the drift, spread, weathering and fate of the spilled hydrocarbons.

Modelling was conducted using a stochastic approach, which involved running 100 spills for each season, for each scenario and location with each simulation having the same information (i.e. location volume and oil properties) but randomly selected start times to ensure a range of wind and current conditions were assessed. Once all 100 simulations were run for a given scenario and location, the results were combined to determine the seasonal exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA 2019).

Hydrocarbon Properties

The MDO used in this study has a density of 829.1 kg/m³ (API gravity of 37.6) and a dynamic viscosity of 4.0 cP at 25°C. The MDO is characterised by a high percentage of volatile components (95%), which will evaporate when on the sea surface. It also contains 5% persistent hydrocarbons, which will not evaporate, though will decay over time. Additionally, the MDO classified as a Group II light persistent oil. It is important to note that some heavy components contained in MDO have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) and breaking waves but can re-float to the surface when the winds ease.

Key Findings

Location 1

- The maximum distance from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 49.8 km (winter), 15.5 km (summer) and 4.0 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during winter at 12%, while the minimum time before shoreline accumulation at the low threshold was 4.25 days predicted during winter. The maximum total volume of oil ashore was predicted during the winter with 8.2 m³.
- The maximum distance from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 92 km (winter) and 12 km (summer), respectively. No exposure at the high (400 ppb) threshold was predicted.
- The maximum distance from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 648 km (winter) and 148 km (winter), respectively.

Location 2

- The maximum distance from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 42.7 km (winter), 19.2 km (summer) and 5.2 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during winter at 68%, while the minimum time before shoreline accumulation at the low threshold was 1.50 days predicted during winter. The maximum total volume of oil ashore was predicted during the winter with 47.4 m³.
- The maximum distance from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 89 km (winter) and 13 km (summer), respectively. No exposure at the high (400 ppb) threshold was predicted.
- The maximum distance from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 356 km (winter) and 150 km (winter), respectively.

Location 3

- The maximum distance from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 60.0 km (winter), 28.3 km (winter) and 4.7 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during winter at 33%, while the minimum time before shoreline accumulation at the low threshold was 2.29 days predicted during winter. The maximum volume of oil ashore was predicted during the winter with 28.8 m³.
- The maximum distance from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 94 km (winter) and 15 km (summer), respectively. No exposure at the high (400 ppb) threshold was predicted.

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- The maximum distance from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 497 km (winter) and 157 km (winter), respectively.

1 BACKGROUND

1.1 Introduction

ConocoPhillips Australia SH1 Pty Ltd (ConocoPhillips) is considering an exploration drilling campaign in Permit T/49P, in Commonwealth waters. The closest points from the permit area are the west coast of King Island (23.5 km east) and Victorian coastline (26 km north). Water depths in the permit area range from 70 m to 1,000 m, with approximately 90% of the survey area being in water depths less than 150 m.

To support the environmental approvals, Xodus on behalf of ConocoPhillips had commissioned RPS to undertake an additional oil spill modelling study, which assessed the potential exposure from a 350 m³ release of Marine Diesel Oil (MDO) over 6 hours due to a loss of containment following a vessel collision.

The oil spill modelling used the same three locations as the recent subsea loss of well control (LOWC) study, and Table 1.1 presents the coordinates of the release locations and Figure 1.1 is the location map.

The potential exposure to the surrounding waters and shorelines were assessed for summer (October to March) and winter (April to September) seasons.

One of the purposes of the modelling is to define the 'outer boundaries' of the environment that may be affected (EMBA) in the unlikely event of a hydrocarbon release scenario. Therefore, the modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

The hydrocarbon spill model, the method and analysis applied herein uses modelling algorithms which have been peer reviewed and published in international journals. Further, RPS warrants that this work meets and exceeds the American Society for Testing and Materials (ASTM) Standard F2067-13 "*Standard Practice for Development and Use of Oil Spill Models*".

Table 1.1 T/49P hydrocarbon spill modelling release locations.

Release location	Latitude*	Longitude*	Water depth (m)
Location 1	39° 15' 46.6" S	143° 20' 26.4" E	93
Location 2	39° 47' 49.7" S	143° 30' 46.3" E	100
Location 3	40° 13' 5.3" S	143° 29' 10.9" E	114

*Datum: WGS 1984

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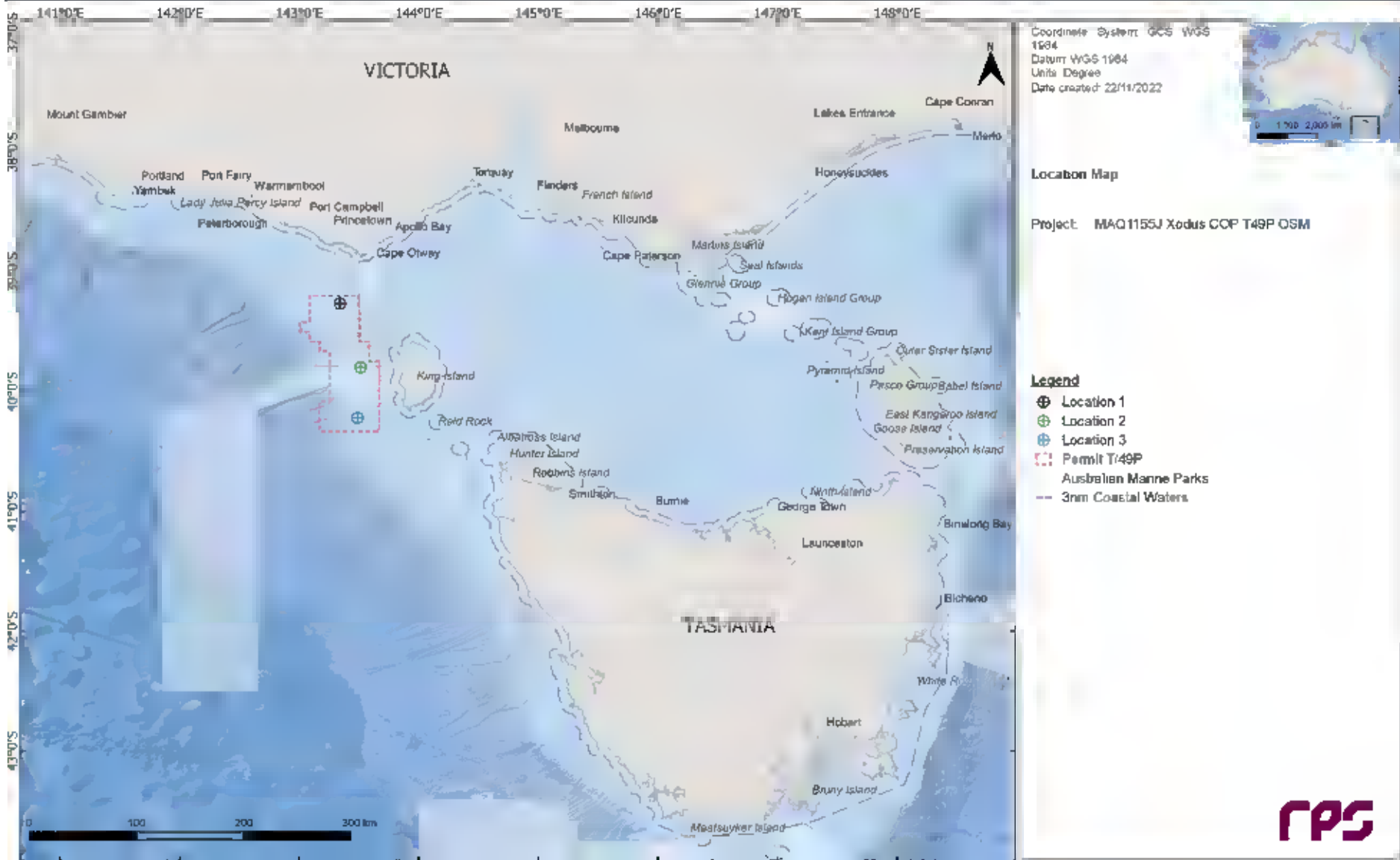


Figure 1.1 T/49P hydrocarbon spill modelling release locations.

1.2 What is Oil Spill Modelling?

Oil spill modelling is a valuable tool widely used for risk assessment, emergency response and contingency planning where it can be particularly helpful to proponents and decision makers. By modelling a series of the most likely oil spill scenarios, decisions concerning suitable response measures and strategic locations for deploying equipment and materials can be made, and the locations at most risk can be identified. The two types of oil spill modelling often used are stochastic (Section 1.2.1) and deterministic (Section 1.2.2) modelling.

1.2.1 Stochastic Modelling (Multiple Spill Simulations)

Stochastic oil spill modelling is created by overlaying a great number (often hundreds) of individual, computer-simulated hypothetical spills (NOPSEMA, 2018; Figure 1.2).

Stochastic modelling is a common means of assessing the potential risks from oil spills related to new projects and facilities. Stochastic modelling typically utilises hydrodynamic data for the location in combination with historic wind data. Typically, 100 iterations of the model will be run utilising the data that is most relevant to the season or timing of the project.

The outcomes are often presented as a probability of exposure and is primarily used for risk assessment purposes in view to understand the range of environments that may be affected or impacted by a spill. Elements of the stochastic modelling can also be used in oil spill preparedness and planning.

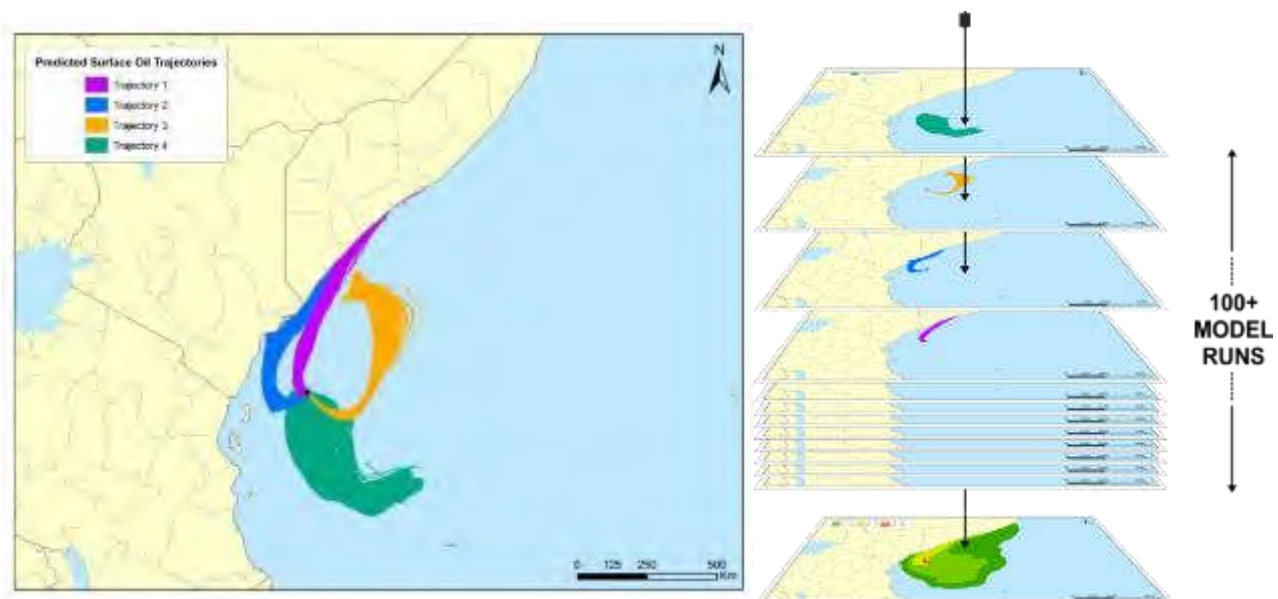


Figure 1.2 Examples of four individual spill trajectories (four replicate simulations) predicted by SIMAP for a spill scenario. The frequency of contact with given locations is used to calculate the probability of impacts during a spill. Essentially, all model runs are overlain (shown as the stacked runs on the right) and the number of times that trajectories contact a given location at a concentration is used to calculate the probability.

1.2.2 Deterministic Modelling (Single Spill Simulation)

Deterministic modelling is the predictive modelling of a single incident subject to a single sample of wind and weather conditions over time (NOPSEMA, 2018; Figure 1.3).

Deterministic modelling is often paired with stochastic modelling to place the large stochastic footprint into perspective. This deterministic analysis is generally a single run selected from the stochastic analysis and serves as the basis for developing the plans and equipment needs for a realistic spill response. Deterministic spills can be selected on based on parameters such as minimum time to shoreline, largest swept area, maximum volume ashore and longest length of shoreline contacted by hydrocarbons.

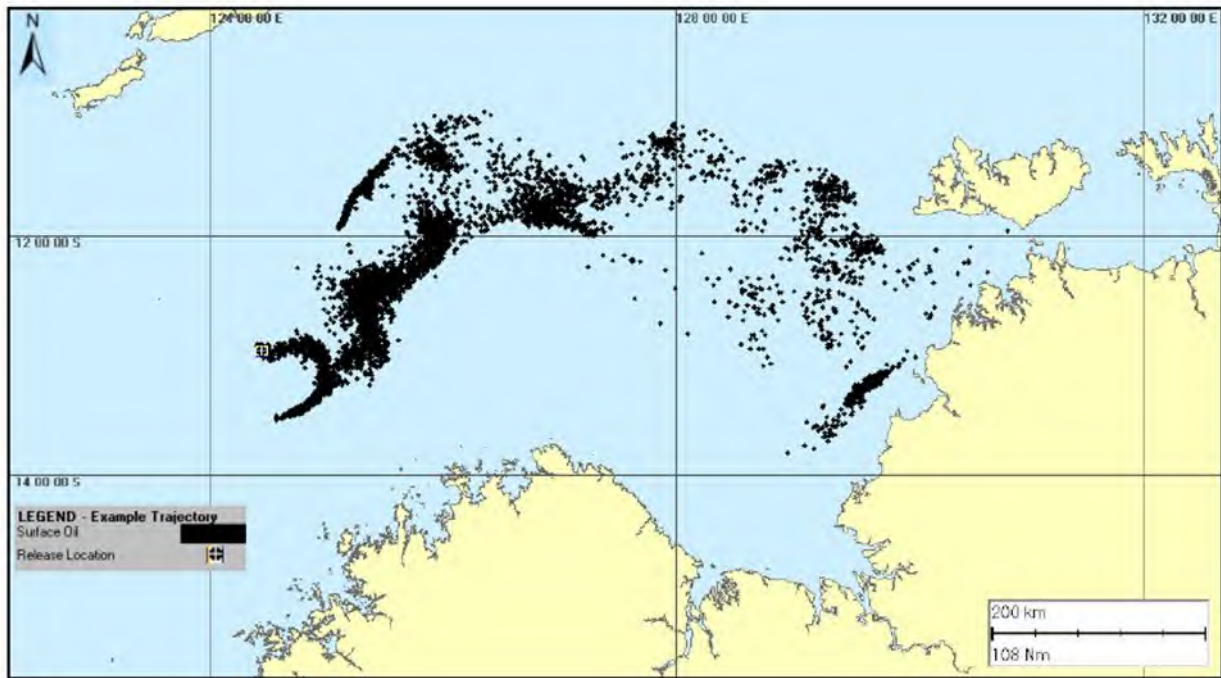


Figure 1.3 Example of an individual spill trajectory predicted by SIMAP for a spill scenario. Note, this image represents surface oil as spill and does not take any thresholds into consideration.

2 SCOPE OF WORK

The scope of work included the following components:

1. Generate 10 years (2010 to 2019 (inclusive)) of wind and current data. The three-dimensional current data includes the combined influence of ocean and tidal currents;
2. Include the wind and current data and the hydrocarbon characteristics as input into the three-dimensional oil spill model, SIMAP, to model the movement, spreading, weathering and shoreline accumulation by hydrocarbons over time;
3. Run 100 oil spill simulations per season (200 total per location), with each simulation having the same spill information (i.e. location volume and oil properties) but varying start times. This ensured that each spill trajectory was subjected to a unique set of wind and current conditions;
4. Combine the results from the 100 spill simulations (per season) per location to assess the exposure to waters and shoreline accumulation based upon the NOPSEMA thresholds;
5. Present the combined results from the 200 spill simulations, per location, to assess the low threshold environment that maybe affected (EMBA); and
6. From the 200 simulations modelled for each location identify and present the “worst case” deterministic run resulting in the maximum volume of hydrocarbons ashore. From the results for all three locations, identify and present the deterministic simulations resulting in: a) largest area of floating hydrocarbon exposure; b) minimum time to shoreline exposure; and c) longest length of shoreline accumulation.

3 REGIONAL CURRENTS

The Otway Basin lies within the western portion of the Bass Strait, a sea strait separating Tasmania from the southern Australian mainland. The strait is a relatively shallow area of the continental shelf, connecting the southeast Indian Ocean with the Tasman Sea. This region has a reputation for high winds and strong tidal currents (Jones, 1980). Currents are primarily driven by tides, winds and density driven flows. During winter the South Australian current moves dense, salty water eastward from the Great Australian Bight into the western margin of the Bass Strait (Sandery & Kämpf, 2007). In winter and spring, waters within the strait are well mixed with no obvious stratification, while during summer the central regions of the strait become stratified (Baines & Fandry, 1983; Middleton & Black, 1994).

Figure 3.1 displays seasonal current trends within the Otway Basin-Bass Strait region. During winter there is a strong eastward water flow due to the strengthening of the South Australian Current (fed by the Leeuwin Current in the Northwest Shelf), which bifurcates with one extension moving through the Bass Strait, and another forming the Zeehan Current off western Tasmania (Sandery & Kämpf, 2007). During summer, water flow reverses off Tasmania, King Island and the Otway Basin travelling eastward, as the coastal current develops due to south-easterly winds.

Therefore, to accurately account for the movement of an oil spill, which can move between the offshore and near shore region, ocean and tidal currents were combined as part of the study. The following sections provide a summary of the regional current data set.

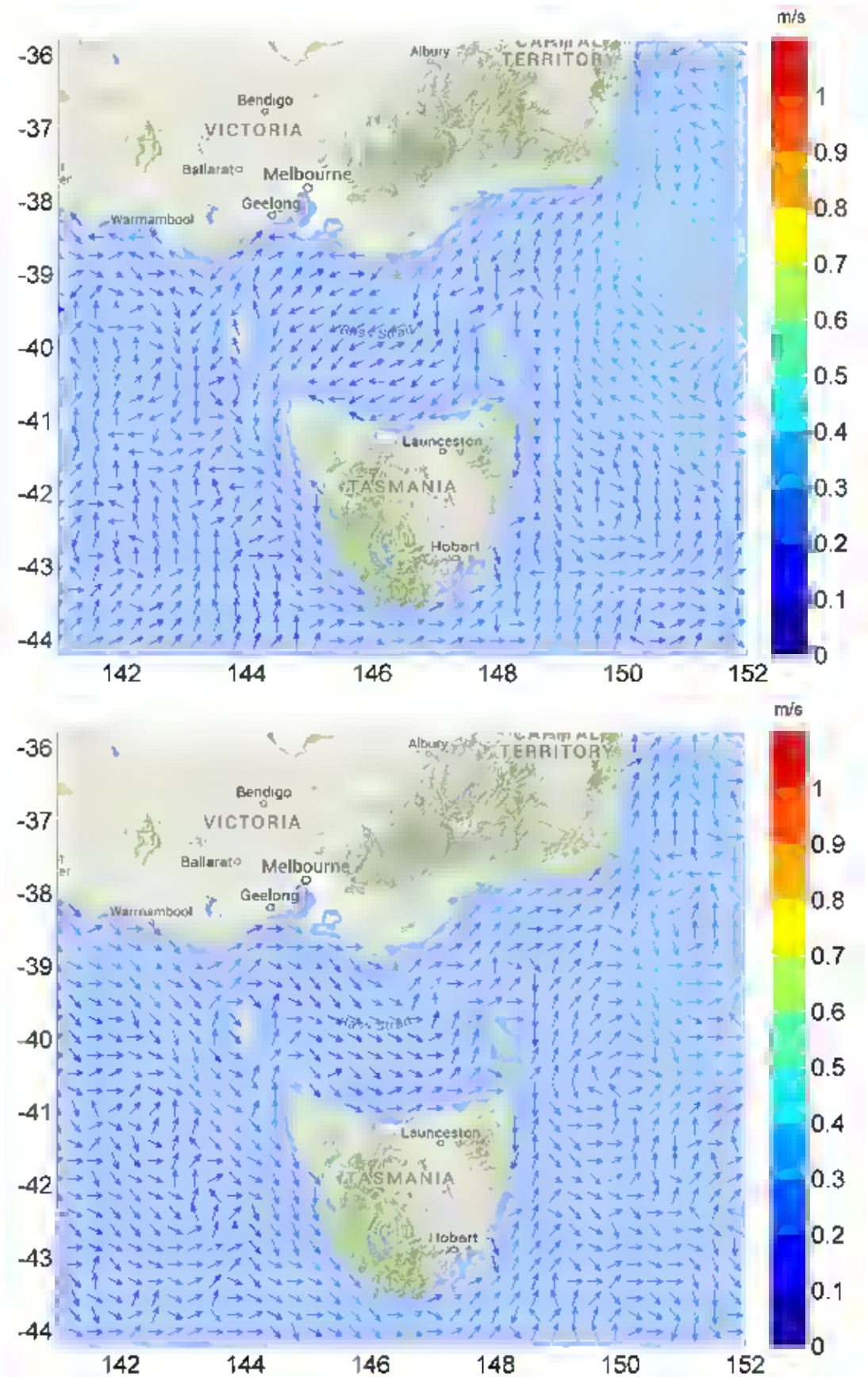


Figure 3.1 HYCOM averaged seasonal surface drift currents during summer (upper image) and winter (lower image).

3.1 Tidal currents

Tidal current data was generated using RPS's advanced ocean/coastal model, HYDROMAP. The HYDROMAP model has been thoroughly tested and verified through field measurements throughout the world for more than 30 years (Isaji & Spaulding, 1984; Isaji, et al., 2001; Zigic, et al., 2003). HYDROMAP tidal current data has been used as input to forecast (in the future) and hindcast (in the past) pollutant spills in Australian waters and forms part of the Australian National Oil Spill Emergency Response System operated by AMSA (Australian Maritime Safety Authority).

HYDROMAP employs a sophisticated sub-gridding strategy, which supports up to six levels of spatial resolution, halving the grid cell size as each level of resolution is employed. The sub-gridding allows for higher resolution of currents within areas of greater bathymetric and coastline complexity, and/or of interest to a study.

The numerical solution methodology follows that of Davies (1977a 1977b) with further developments for model efficiency by Owen (1980) and Gordon (1982). A more detailed presentation of the model can be found in Isaji & Spaulding (1984) and Isaji et al. (2001).

3.1.1 Grid Setup

The tidal model domain has been sub-gridded down to a resolution of 500 m for shallow and coastal regions, starting from an offshore (or deep water) resolution of 8 km. The finer grids were allocated in a step-wise fashion to resolve flows more accurately along the coastline, around islands and over regions with more complex bathymetry. Figure 3.2 shows the tidal model grid covering the study domain.

A combination of datasets was used and merged to describe the shape of the seabed within the grid domain (Figure 3.3). These included spot depths and contours which were digitised from nautical charts released by the hydrographic offices as well as Geoscience Australia database and depths extracted from the Shuttle Radar Topography Mission (SRTM30_PLUS) Plus dataset (see Becker et al., 2009).

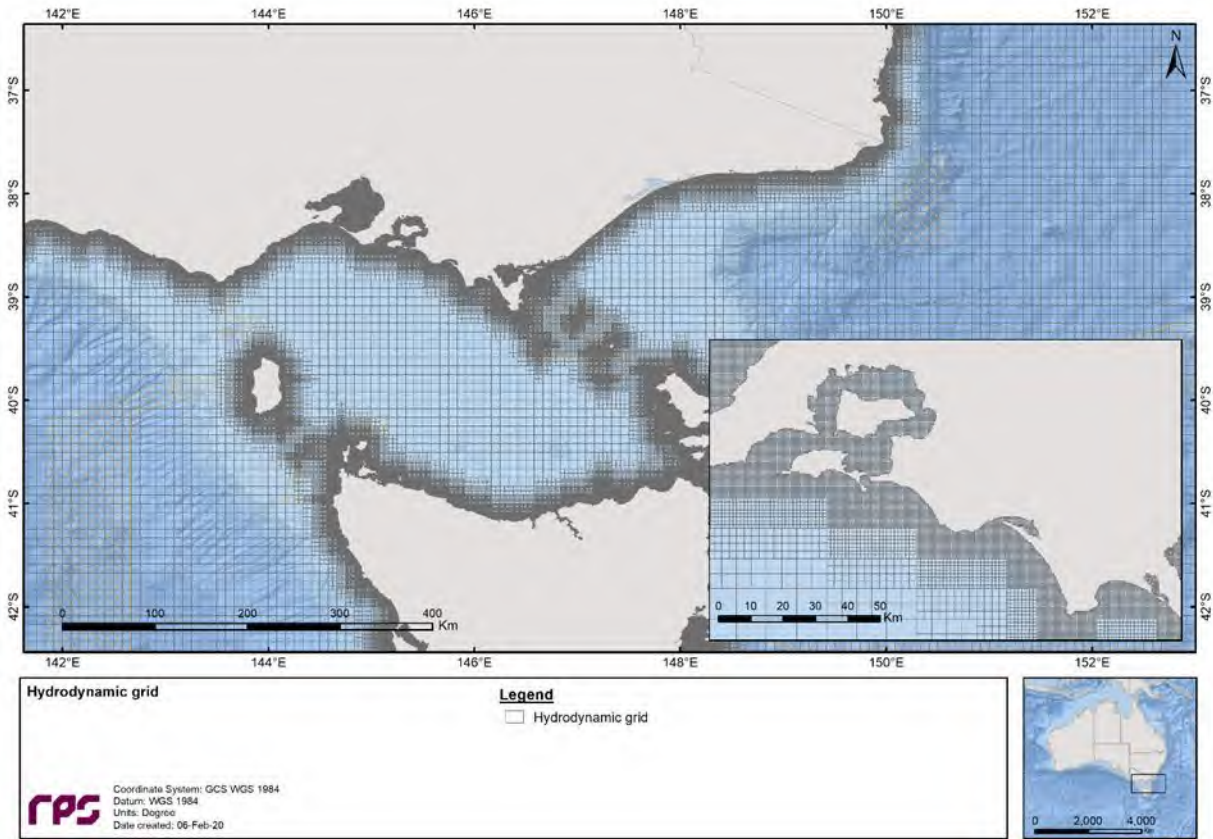


Figure 3.2 Sample of the model grid used to generate the tidal currents for the study region. Higher resolution areas are shown by the denser mesh.

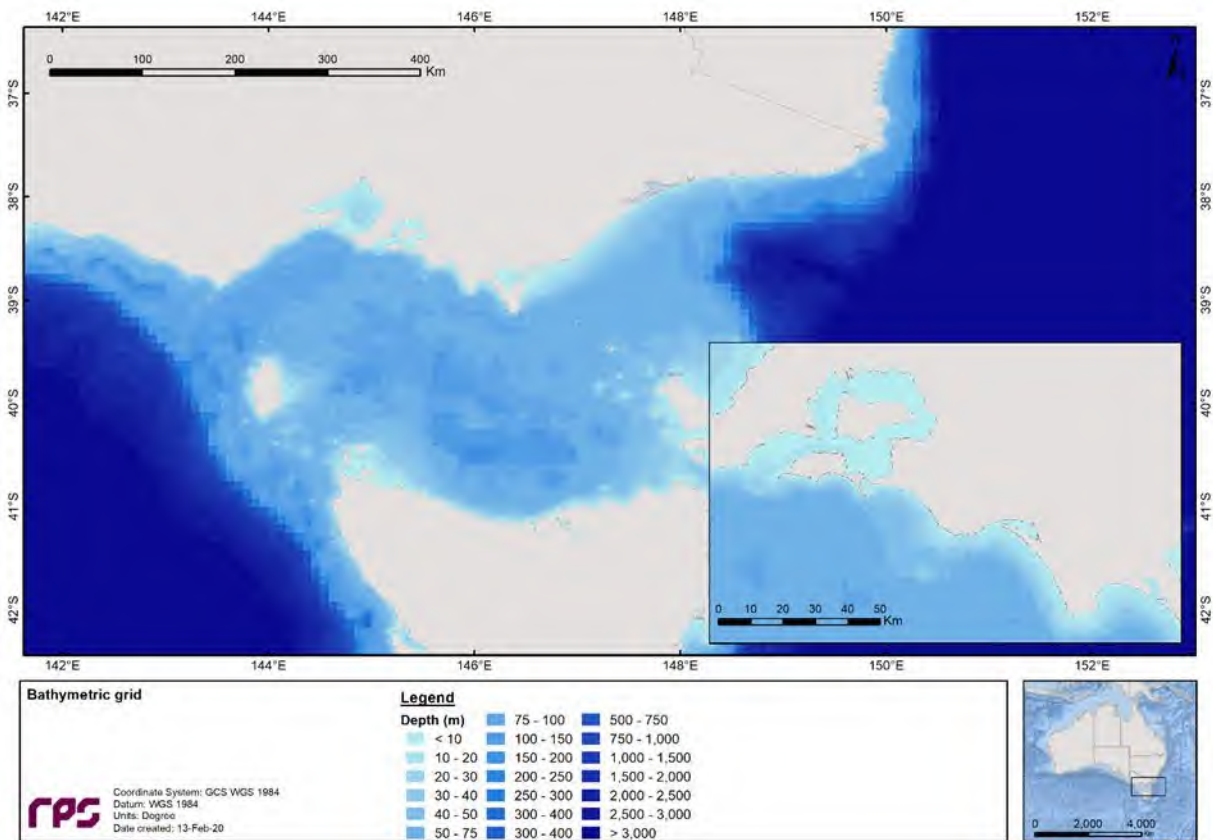


Figure 3.3 Bathymetry defined throughout the tidal model domain.

3.1.2 Tidal Conditions

The ocean boundary data for the regional model was obtained from satellite measured altimetry data (TOPEX/Poseidon 8.0) which provided estimates of the eight dominant tidal constituents at a horizontal scale of approximately 0.25 degrees. The eight major tidal constituents used were K_2 , S_2 , M_2 , N_2 , K_1 , P_1 , O_1 and Q_1 . Using the tidal data, time series surface heights were calculated along the open boundaries for the simulation period.

The Topex/Poseidon satellite data has a resolution of 0.25 degrees globally, with higher resolution in coastal regions, and is produced and quality controlled by NASA (National Aeronautics and Space Administration). The data capturing satellites, equipped with two altimeters capable of taking sea level measurements accurate to less than ± 5 cm, measured oceanic surface elevations (and the resultant tides) for the period 1992–2005. In total these satellites carried out 62,000 orbits of the planet. The Topex/Poseidon tidal data has been widely used amongst the oceanographic community, being referenced in more than 2,100 research publications (e.g., Andersen, 1995; Ludicone et al., 1998; Matsumoto et al., 2000; Kostianoy et al., 2003; Yaremchuk & Tangdong, 2004; Qiu & Chen, 2010). The Topex/Poseidon tidal data is considered suitably accurate for this study.

3.2 Ocean Currents

Data describing the flow of ocean currents was obtained from HYCOM (Hybrid Coordinate Ocean Model, (Chassignet et al., 2007), which is operated by the HYCOM Consortium, sponsored by the Global Ocean Data Assimilation Experiment (GODAE). HYCOM is a data-assimilative, three-dimensional ocean model that is run as a hindcast (for a past period), assimilating time-varying observations of sea surface height, sea surface temperature and in-situ temperature and salinity measurements (Chassignet et al., 2009). The HYCOM predictions for drift currents are produced at a horizontal spatial resolution of approximately 8.25 km ($1/12^{\text{th}}$ of a degree) over the region, at a frequency of three-times per day. HYCOM uses isopycnal layers in the open, stratified ocean, but uses the layered continuity equation to make a dynamically smooth transition to a terrain-following coordinate in shallow coastal regions, and to z-level coordinates in the mixed layer and/or unstratified seas.

For this study, the HYCOM hindcast currents were obtained for the years 2010 to 2019 (inclusive).

3.3 Surface Currents

Figure 3.4 to Figure 3.6 show the monthly current rose distributions for the three locations, while Figure 3.7 to Figure 3.9 illustrate the total current rose distributions.

Note the convention for defining current direction is the direction the current flows towards, which is used to reference current direction throughout this report. Each branch of the rose represents the currents flowing to that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent the current speed ranges for each direction. Speed intervals of 0.1 m/s are predominantly used in these current roses. The length of each coloured segment is relative to the proportion of currents flowing within the corresponding speed and direction.

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143 34°E, Latitude = 39 26°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020

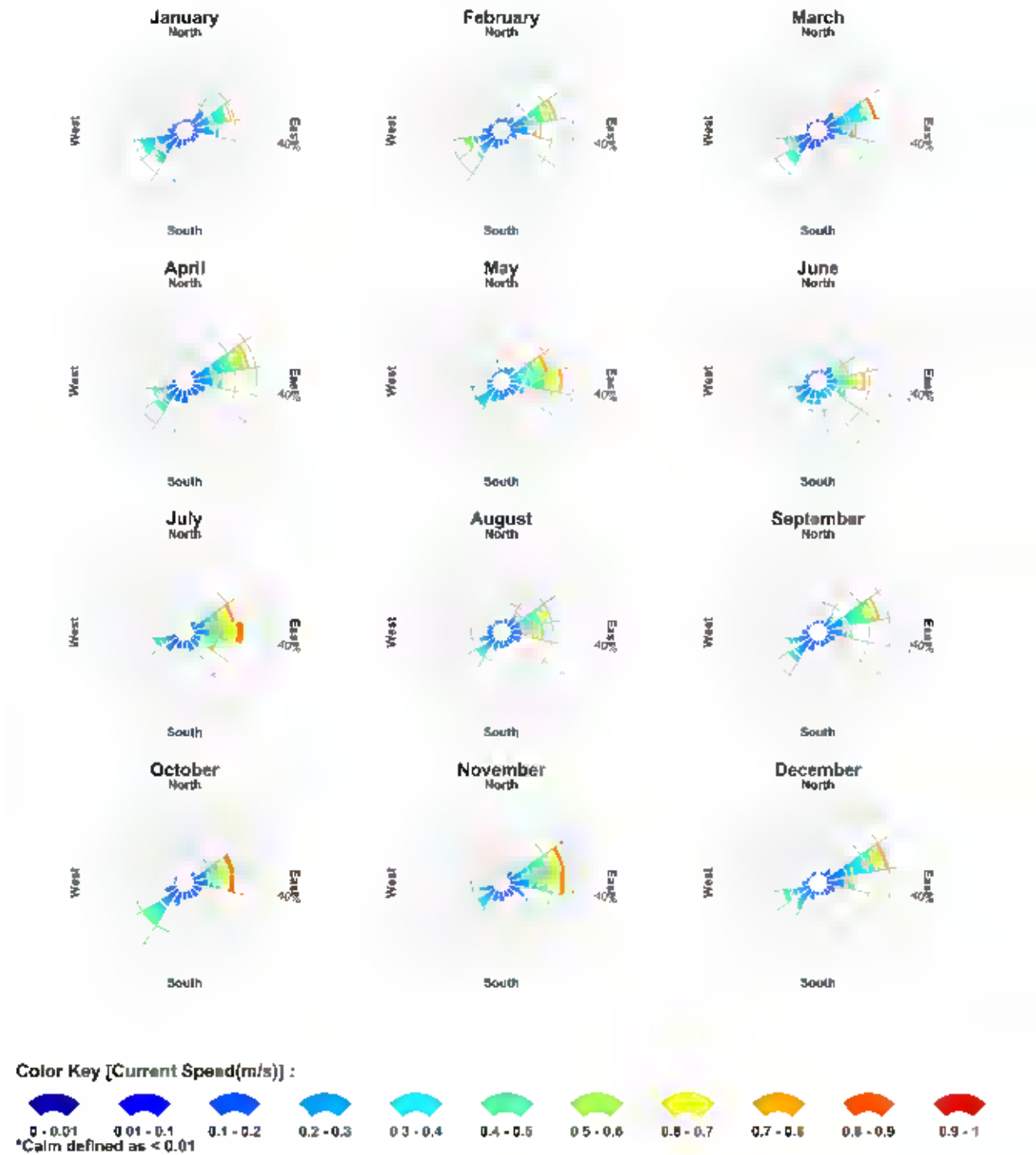


Figure 3.4 Monthly surface current rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143 51°E, Latitude = 39 80°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020

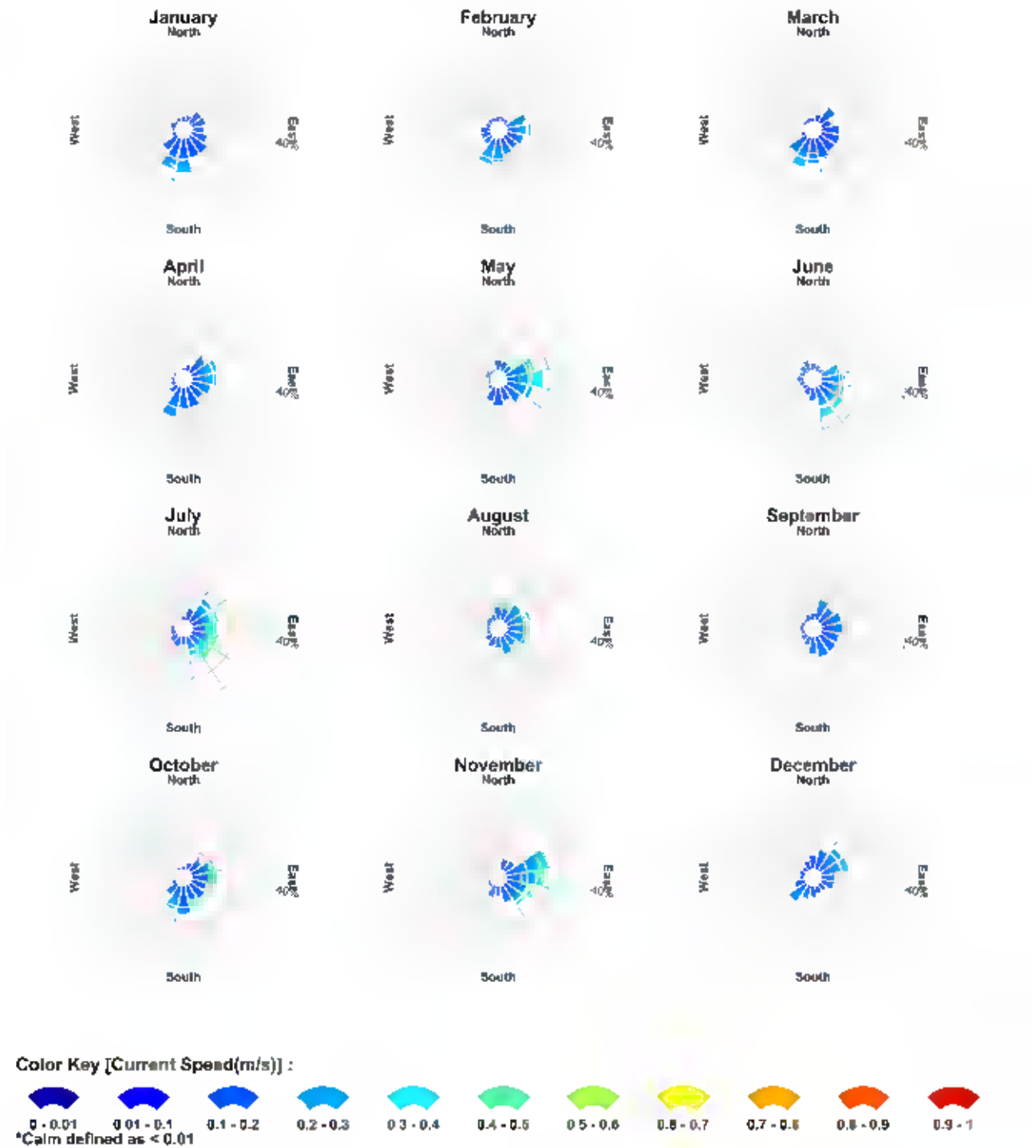


Figure 3.5 Monthly surface current rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143 49°E, Latitude = 40 22°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020

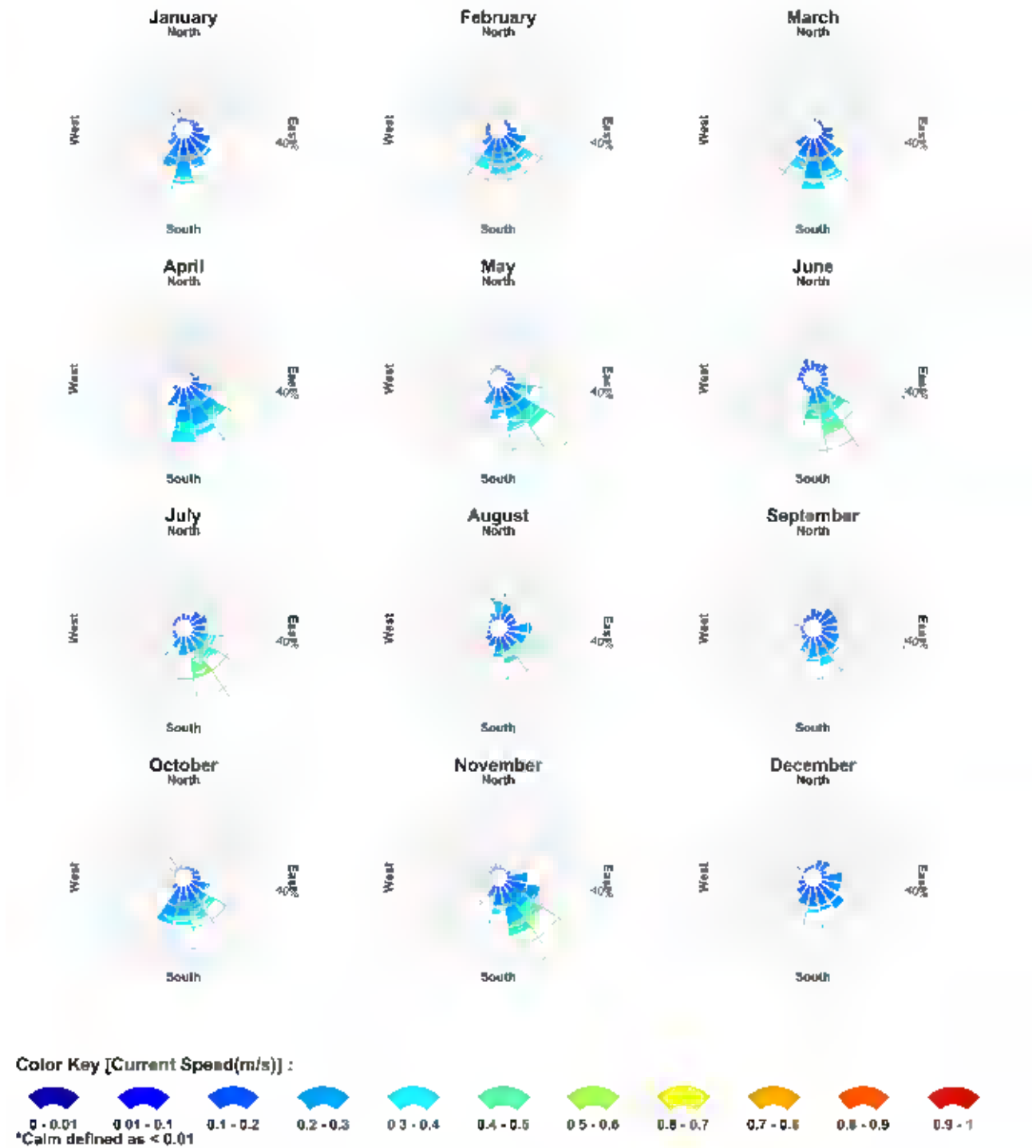


Figure 3.6 Monthly surface current rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143.34°E, Latitude = 39.26°S
 Analysis Period: 01-Jan-2019 to 02-Jan-2020

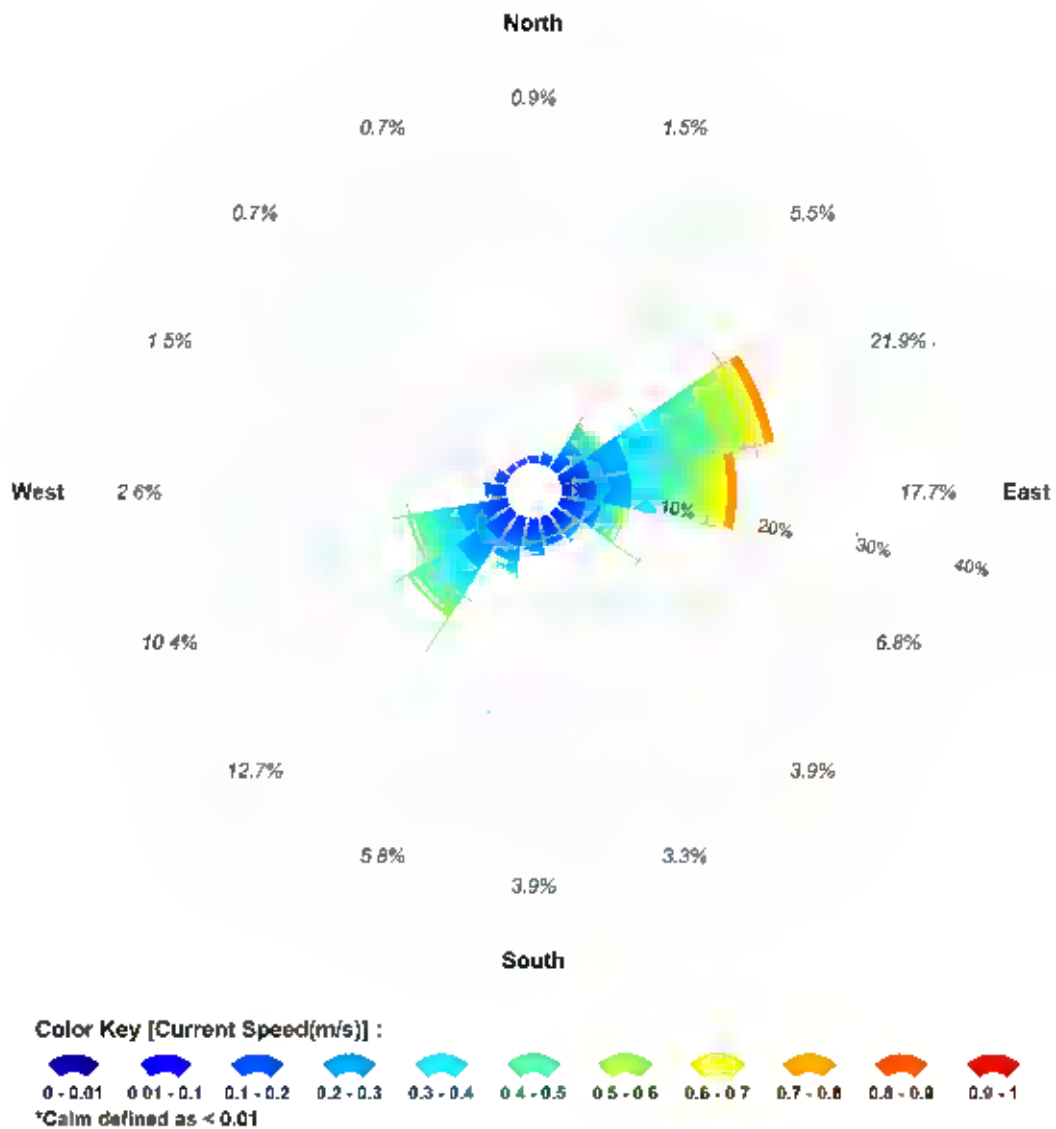


Figure 3.7 Total surface current rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143.51°E, Latitude = 39.80°S
 Analysis Period: 01-Jan-2019 to 02-Jan-2020

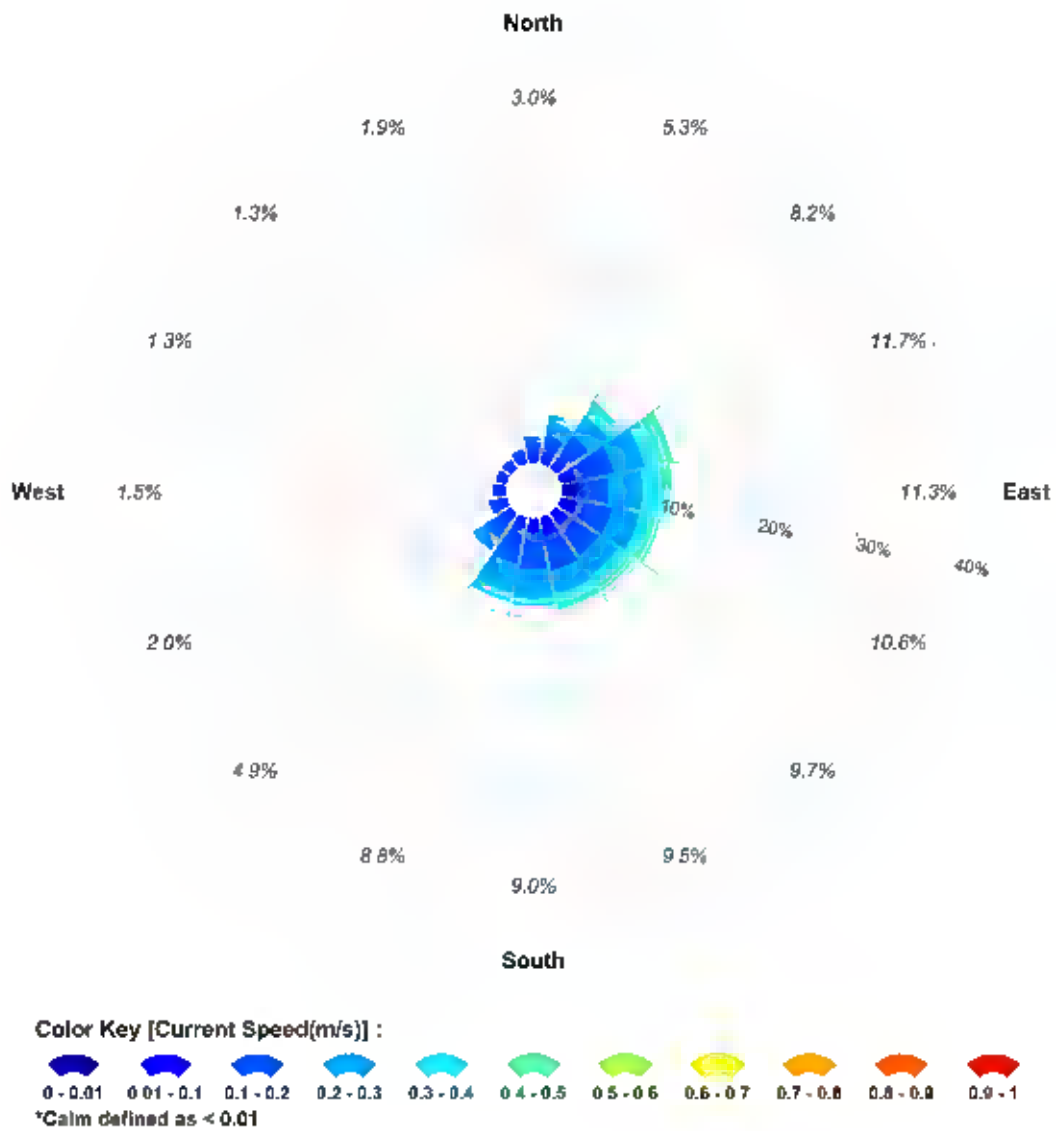


Figure 3.8 Total surface current rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143.49°E, Latitude = 40.22°S

Analysis Period: 01-Jan-2019 to 02-Jan-2020

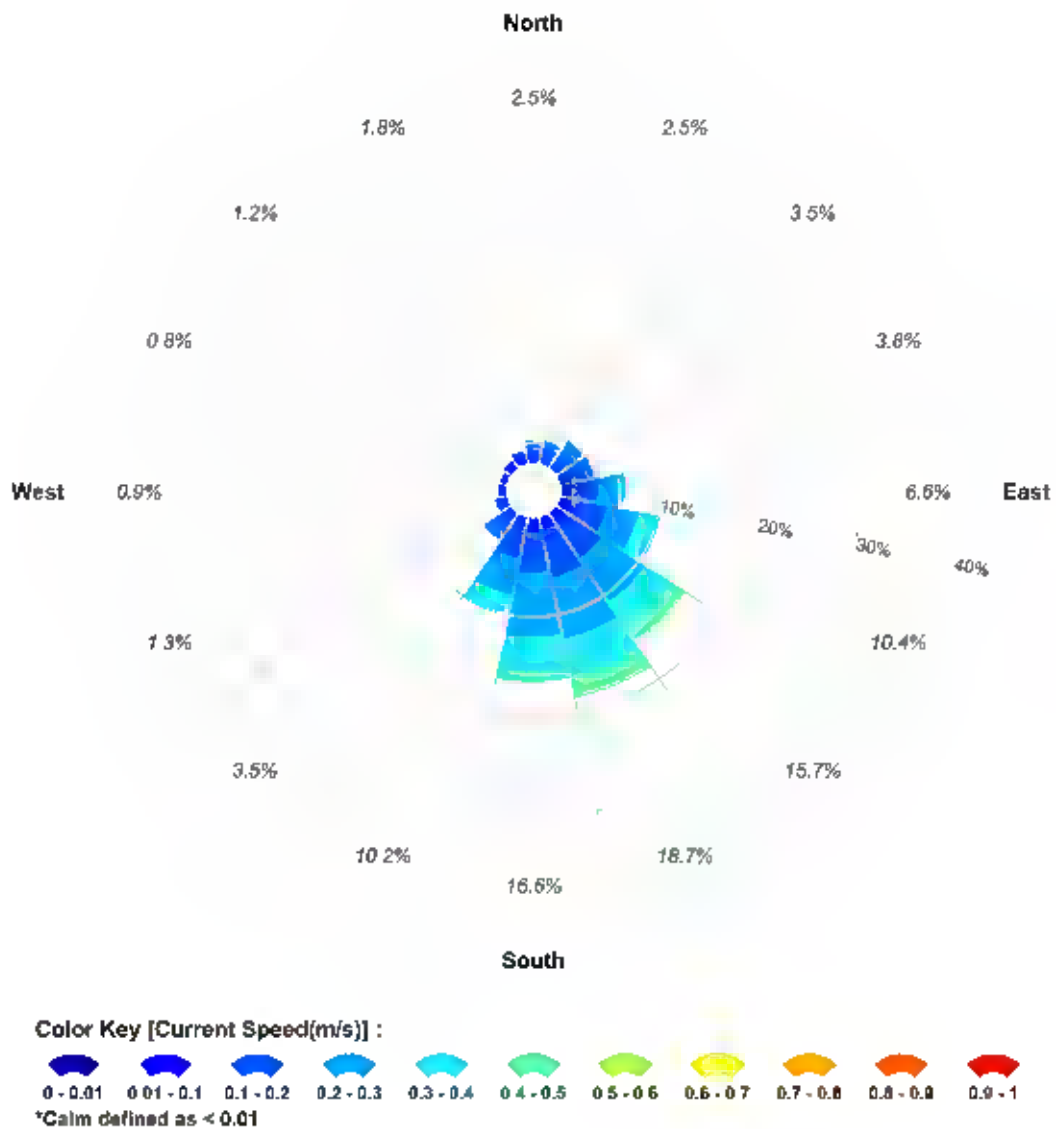


Figure 3.9 Total surface current rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

4 WIND DATA

To account for the influence of the wind on the hydrocarbons floating on the surface, wind data from 2010 to 2019 (inclusive) was sourced from the National Centre for Environmental Prediction (NCEP) Climate Forecast System Reanalysis dataset (CFSR; see Saha et al., 2010). The CFSR wind model includes observations from many data sources: surface observations, upper-atmosphere air balloon observations, aircraft observations and satellite observations. The model is capable of accurately representing the interaction between the earth’s oceans, land and atmosphere. The gridded wind data output is available at a horizontal resolution of 0.25° (~33 km) and a temporal resolution of 1 hour.

Figure 4.1 is a screenshot illustrating the spatial resolution of the CFSR modelled wind data.

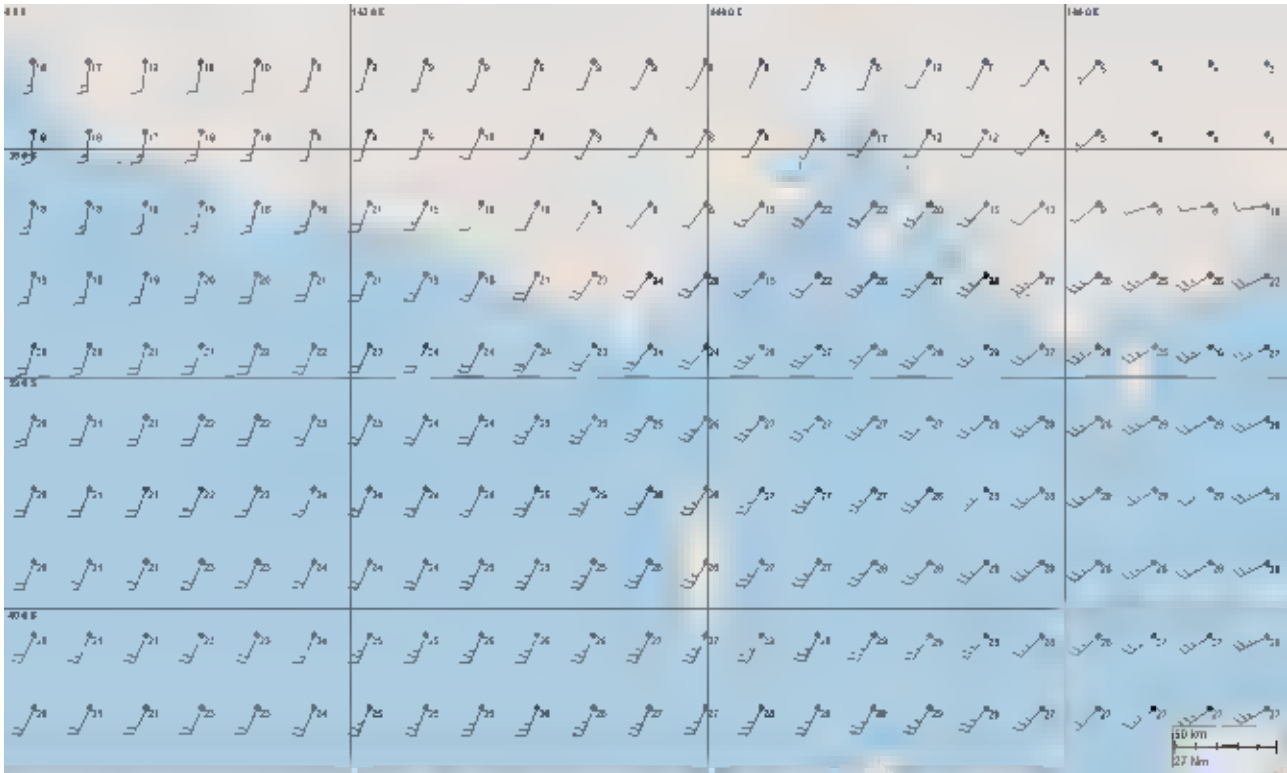


Figure 4.1 Spatial resolution of the CFSR modelled wind data used as input into the oil spill model.

Figure 4.2 to Figure 4.4 shows the monthly wind rose distributions derived from the CFSR nodes closest to the release locations, while Figure 4.5 to Figure 4.7 illustrate the total current rose distribution.

Note that the atmospheric convention for defining wind direction, that is, the direction the wind blows from, is used to reference wind direction throughout this report. Each branch of the rose represents wind coming from that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent wind speed ranges from that direction. Speed ranges of 3 knots are predominantly used in these wind roses. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.34°E, Latitude = 39.26°S
Analysis Period: 01-Jan-2019 to 31-Dec-2019

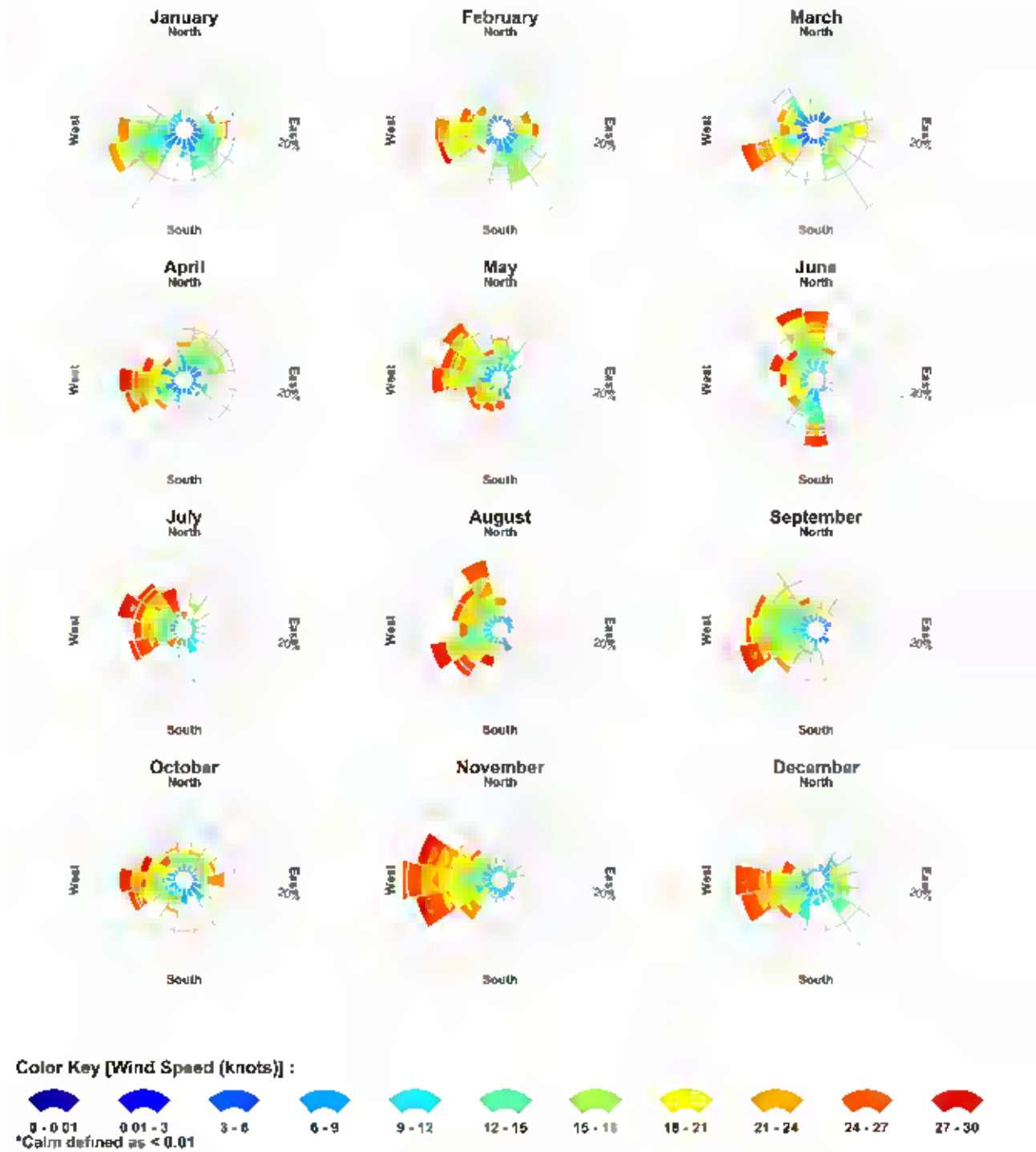


Figure 4.2 Monthly wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.51°E, Latitude = 39.80°S
Analysis Period: 01-Jan-2019 to 31-Dec-2019

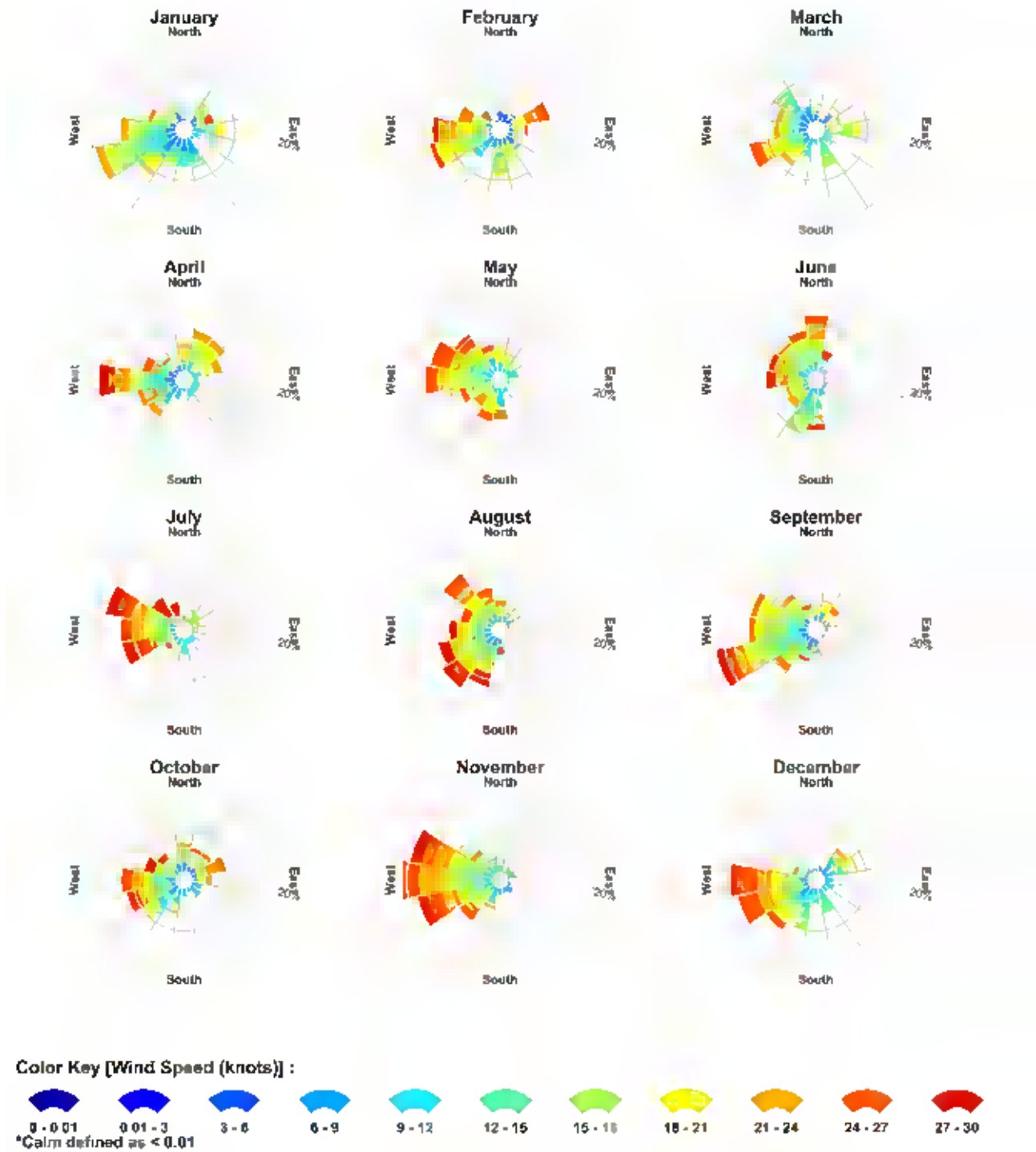


Figure 4.3 Monthly wind rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.49°E, Latitude = 40.22°S
Analysis Period: 01-Jan-2019 to 31-Dec-2019

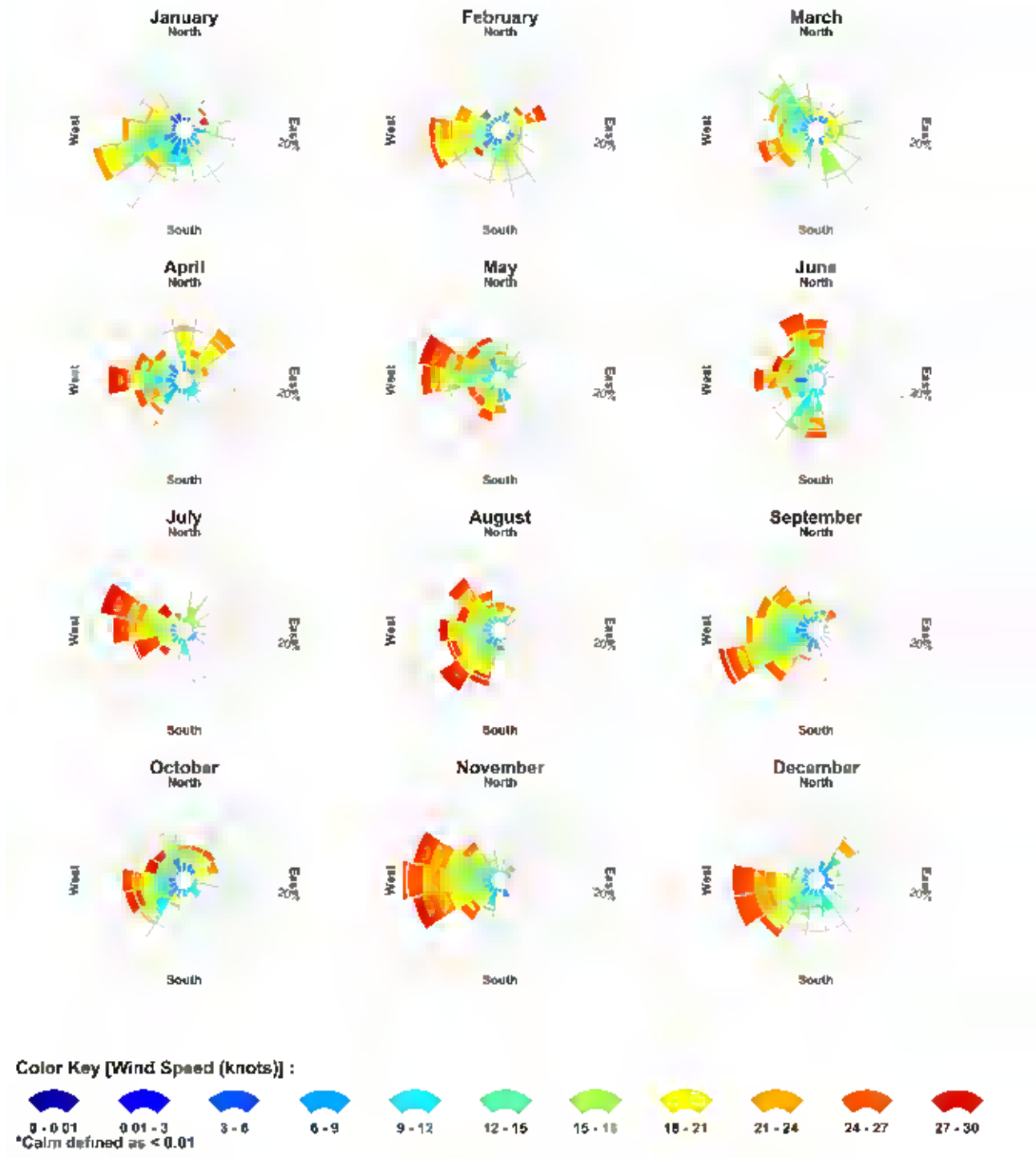


Figure 4.4 Monthly wind rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.34°E, Latitude = 39.26°S
 Analysis Period: 01-Jan-2019 to 31-Dec-2019

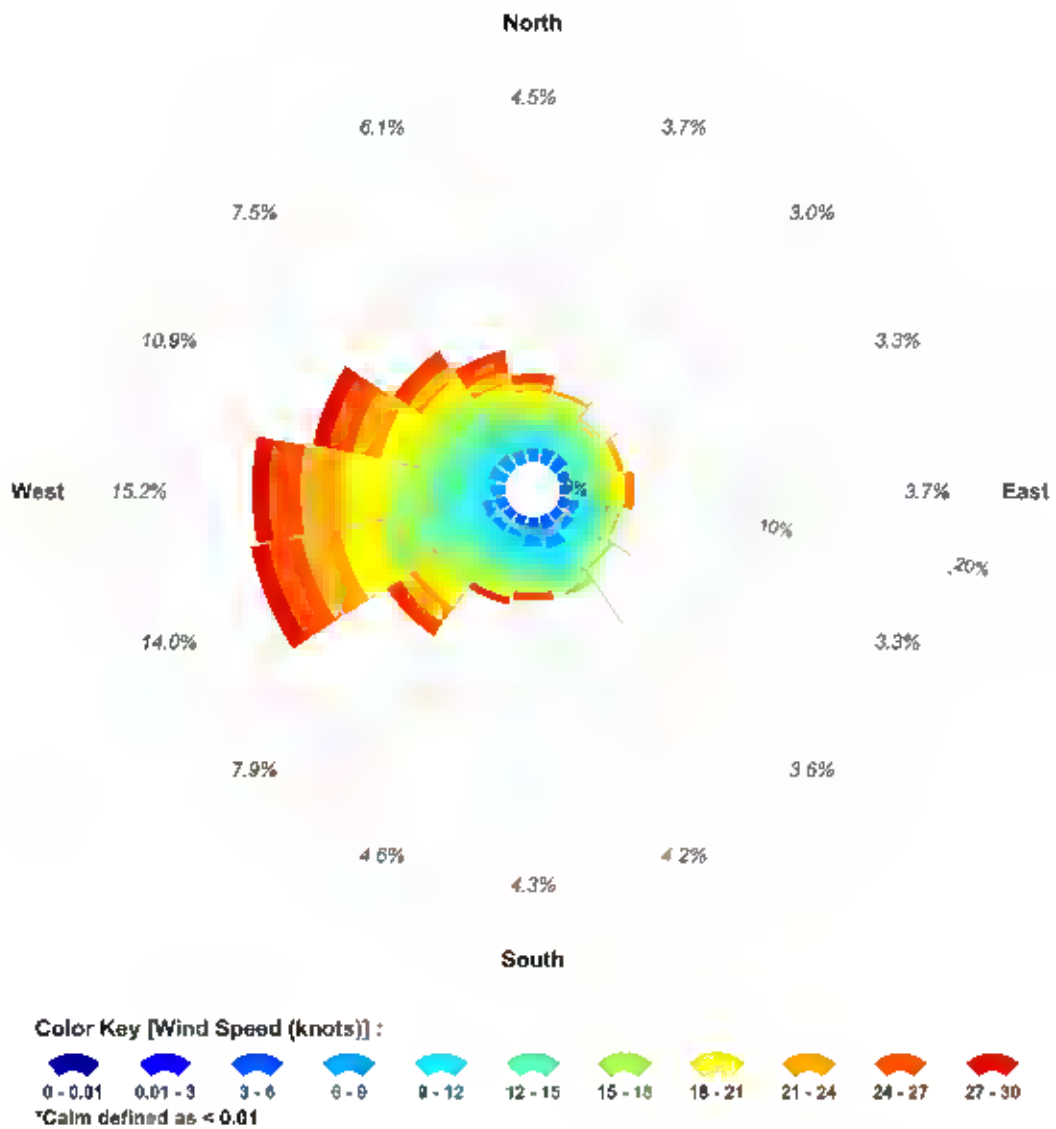


Figure 4.5 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.51°E, Latitude = 39.80°S
 Analysis Period: 01-Jan-2019 to 31-Dec-2019

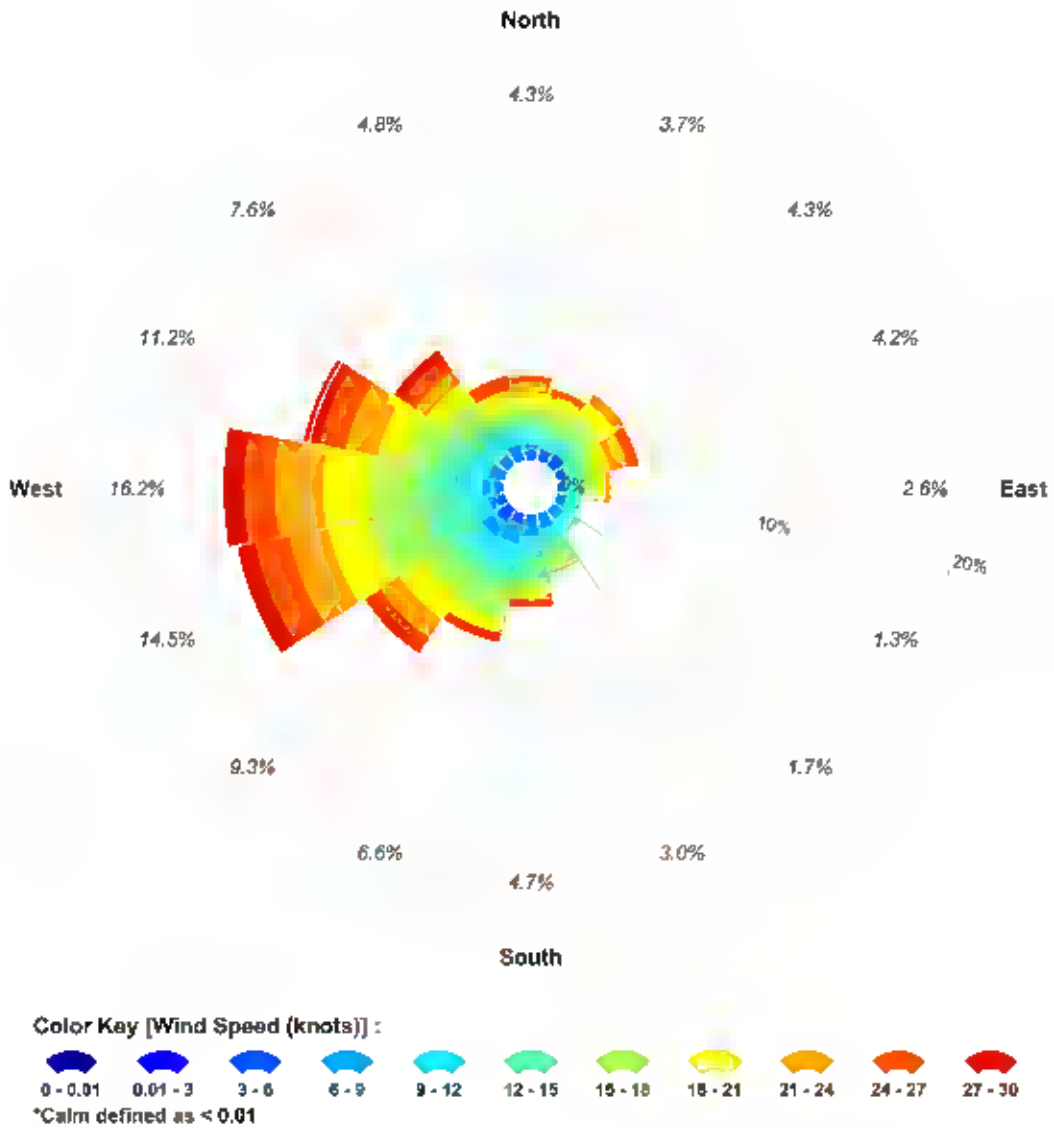


Figure 4.6 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.49°E, Latitude = 40.22°S
 Analysis Period: 01-Jan-2019 to 31-Dec-2019

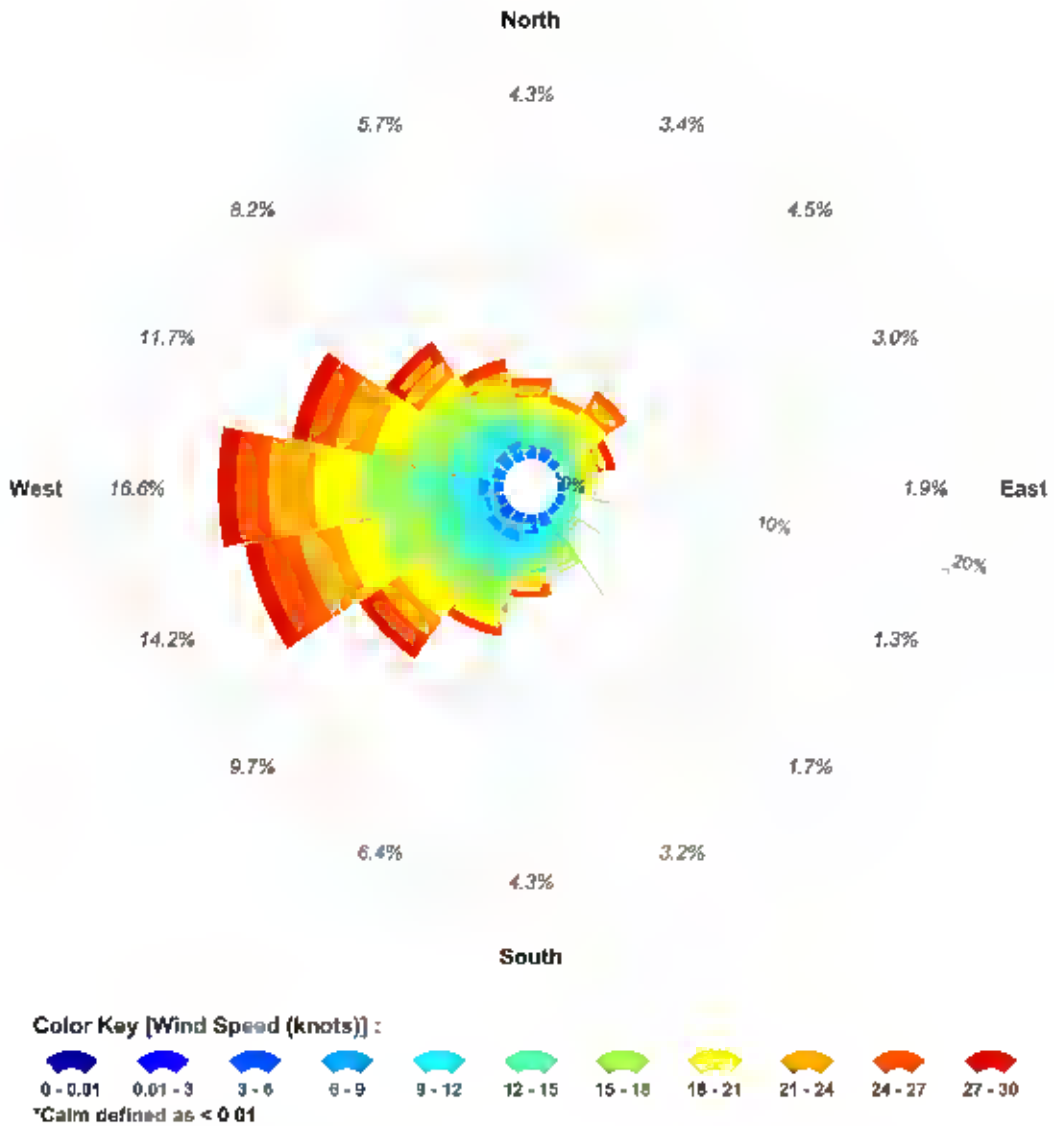


Figure 4.7 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

5 WATER TEMPERATURE AND SALINITY

Monthly water temperature and salinity data was obtained from the World Ocean Atlas 2013 database produced by the National Oceanographic Data Centre (National Oceanic and Atmospheric Administration) and its co-located World Data Center for Oceanography (Levitus et al. 2013). The data is used as input into oil spill model.

The monthly mean sea surface temperature and salinity values in the 0-5 m depth layer are presented in Table 5-1. The monthly average sea surface temperatures ranged between 12.8°C (September, release location 3) and 18.4°C (March, release location 2). The monthly average salinity values remain relatively consistent ranging between 35.1 psu and 35.6 psu.

Figure 5.1 shows the monthly water temperature and salinity profiles adjacent to the release locations.

Table 5-1 Monthly average sea surface temperature and salinity adjacent the release locations.

Release Location		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Temperature (°C)	17.6	17.4	18.1	16.5	15.8	15.1	14.8	13.4	13.0	14.4	14.3	15.7
	Salinity (psu)	35.3	35.1	35.5	35.3	35.3	35.2	35.6	35.3	35.4	35.4	35.4	35.4
2	Temperature (°C)	17.4	17.6	18.4	16.5	15.2	15.1	14.8	13.5	13.3	14.1	14.4	15.7
	Salinity (psu)	35.3	35.2	35.6	35.3	35.3	35.3	35.6	35.3	35.4	35.4	35.4	35.4
3	Temperature (°C)	16.5	17.0	17.6	15.8	14.4	14.0	14.1	13.0	12.8	13.3	13.9	15.3
	Salinity (psu)	35.2	35.1	35.4	35.2	35.2	35.2	35.4	35.2	35.3	35.3	35.3	35.3

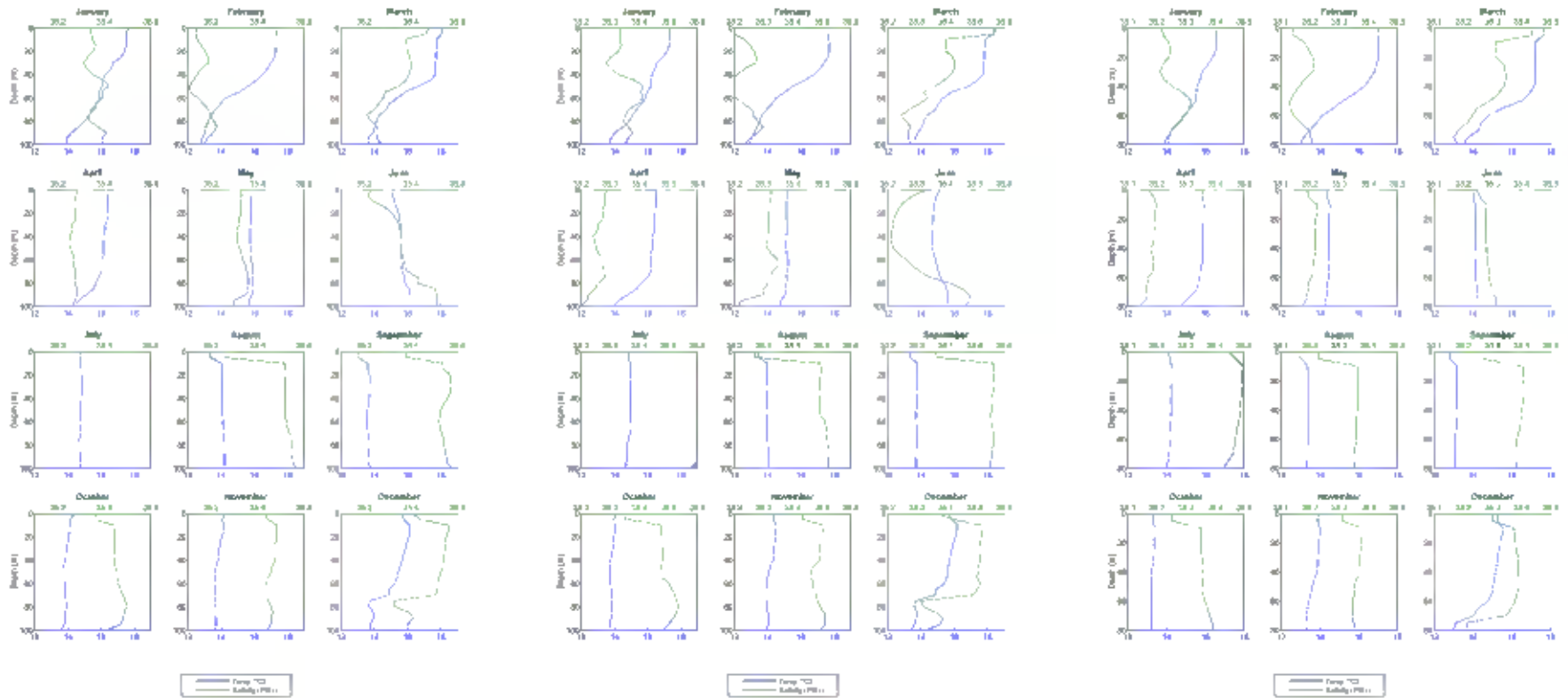


Figure 5.1 Monthly water temperature (blue line) and salinity (green line) profiles for Location 1 (left), Location 2 (middle) and Location 3 (right). Depth of 0 m is the water surface.

6 OIL SPILL MODEL - SIMAP

The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP (Spill Impact Model Application Package). This model is designed to simulate the transport and weathering processes that affect the outcomes of hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns.

SIMAP is the evolution of the United States Environmental Protection Agency (US EPA) Natural Resource Damage Assessment model (French & Rines, 1997; French et al., 1999) and is designed to simulate the fate and effects of spilled oils and fuels for both the surface slick and the three-dimensional plume that is generated in the water column. SIMAP includes algorithms to account for both physical transport and weathering processes. The latter are important for accounting for the partitioning of the spilled mass over time between the water surface (surface slick), water column (entrained oil and dissolved compounds), atmosphere (evaporated compounds) and land (stranded oil). The model also accounts for the interaction between weathering and transport processes.

The physical algorithms calculate transport and spreading by physical forces, including surface tension, gravity and wind and current forces for both surface slicks and oil within the water column. The fates algorithms calculate all the weathering processes known to be important for oil spilled to marine waters. These include droplet and slick formation, entrainment by wave action, emulsification, dissolution of soluble components, sedimentation, evaporation, bacterial and photo-chemical decay and shoreline interactions. These algorithms account for the specific oil type being considered.

Entrainment is the physical process where globules of oil are transported from the sea surface into the water column by wind and wave-induced turbulence or be generated subsea by a pressurised discharge at depth. It has been observed that entrained oil is broken into droplets of varying sizes. Small droplets spread and diffuse into the water column, while larger ones rise rapidly back to the surface (Delvigne & Sweeney, 1988; Delvigne, 1991).

Dissolution is the process by which soluble hydrocarbons enter the water from a surface slick or from entrained droplets. The lower molecular weight hydrocarbons tend to be both more volatile and more soluble than those of higher molecular weight.

The formation of water-in-oil emulsions, or mousse, which is termed 'emulsification', depends on oil composition and sea state. Emulsified oil can contain as much as 80% water in the form of micrometre-sized droplets dispersed within a continuous phase of oil (Daling & Brandvik, 1991; Bobra, 1991; Daling et al., 1997; Fingas, 1995).

Evaporation can result in the transfer of large proportions of spilled oil from the sea surface to the atmosphere, depending on the type of oil (Gundlach & Boehm, 1981).

Evaporation rates vary over space and time dependent on the prevailing sea temperatures, wind and current speeds, the surface area of the slick and entrained droplets that are exposed to the atmosphere as well as the state of weathering of the oil. Evaporation rates will decrease over time, depending on the calculated rate of loss of the more volatile compounds. By this process, the model can differentiate between the fates of different oil types.

Decay (degradation) of hydrocarbons may occur as the result of photolysis, which is a chemical process energised by ultraviolet light from the sun, and by biological breakdown, termed biodegradation. Many types of marine organisms ingest, metabolise and utilise oil as a carbon source, producing carbon dioxide and water as by-products.

Entrainment, dissolution and emulsification rates are correlated to wave energy, which is accounted for by estimating wave heights from the sustained wind speed, direction and fetch (i.e. distance downwind from land barriers) at different locations in the domain. Dissolution rates are dependent upon the proportion of soluble, short-chained hydrocarbon compounds, and the surface area at the oil/water interface of slicks. Dissolution rates are also strongly affected by the level of turbulence. For example, dissolution rates will be relatively high at the site of the release for a deep-sea discharge at high pressure.

The SIMAP weathering algorithms include terms to represent these dynamic processes. Technical descriptions of the algorithms used in SIMAP and validations against real spill events are provided in French (1998), French et al. (1999) and French-McCay (2004).

Input specifications for oil types include density, viscosity, pour-point, distillation curve (volume of oil distilled off versus temperature) and the aromatic/aliphatic component ratios within given boiling point ranges. The model calculates a distribution of the oil by mass into the following components:

- Surface-bound or floating oil;
- Entrained oil (non-dissolved oil droplets that are physically entrained by wave action);
- Dissolved hydrocarbons (principally the aromatic and short-chained aliphatic compounds);
- Evaporated hydrocarbons;
- Sedimented hydrocarbons; and
- Decayed hydrocarbons.

7 HYDROCARBON PROPERTIES

Table 7.1 and Table 7.2 summarise the physical properties and boiling point ranges for the MDO, respectively.

The MDO has a density of 829.1 kg/m³ (API of 37.6) and a low pour point of -14°C. The low viscosity (4 cP) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation.

Generally, about 6.0% of the MDO mass should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 34.6% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54.4% should evaporate over several days (265°C < BP < 380°C). Approximately 5% (by mass) of MDO will not evaporate, though will decay slowly over time.

The oil is categorised as a group II oil (light-persistent) according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges.

It is important to note that some heavy components contained within the MDO will have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) and breaking waves but can re-float to the surface if these energies abate.

Table 7.1 Physical properties for the marine diesel oil.

Characteristic	Marine Diesel Oil (MDO)
Density (kg/m ³)	829.1 (at 25 °C)
API	37.6
Dynamic viscosity (cP)	4.0 (at 25 °C)
Hydrocarbon property category	Group II
Hydrocarbon property classification	Light persistent oil

Table 7.2 Boiling point ranges for marine diesel oil.

Characteristics	Non-Persistent			Persistent
	Volatile (%)	Semi-volatile (%)	Low-volatility (%)	Residual (%)
Boiling point (°C)	<180	180-265	265-380	>380
Marine diesel oil (MDO)	6.0	34.6	54.4	5.0

8 THRESHOLDS

The thresholds and their relationship to exposure for the sea surface, shoreline, and water column (entrained and dissolved hydrocarbons) are presented in Sections 8.1 to 8.3. Supporting justifications of the adopted thresholds applied during the study and additional context relating to the area of influence are also provided. It is important to note that the thresholds herein are based on NOPSEMA (2019).

8.1 Floating Oil Exposure

The modelling results can be presented to any levels; therefore, thresholds have been specified (based on scientific literature) to record floating oil exposure to the sea-surface at meaningful levels only, described in the following paragraphs.

The low threshold to assess the potential for floating oil exposure, was 1 g/m², which equates approximately to an average thickness of 1 µm, referred to as visible oil. Oil of this thickness is described as rainbow sheen in appearance, according to the Bonn Agreement Oil Appearance Code (Bonn Agreement, 2009; AMSA, 2014). Table 8.1 provides a description of the appearance in relation to exposure zone thresholds used to classify the zones of floating oil exposure. Figure 8.1 shows photographs highlighting the difference in appearance between a rainbow sheen and metallic sheen. The low threshold is considered below levels which would cause environmental harm and it is more indicative of the areas perceived to be affected due to its visibility on the sea surface and potential to trigger temporary closures of areas (i.e., fishing grounds) as a precautionary measure.

Ecological impact has been estimated to occur at 10 g/m², which equates to a film thickness of approximately 10 µm or 0.01 mm (French et al. 1996; French-McCay 2009) as this level of fresh oiling has been observed to mortally impact some birds through adhesion of oil to their feathers, exposing them to secondary effects such as hypothermia. The appearance of oil at this average thickness has been described as a metallic sheen (Bonn Agreement, 2009). Concentrations above 10 g/m² is also considered the lower actionable threshold, where oil may be thick enough for containment and recovery as well as dispersant treatment (AMSA, 2015).

Oil concentrations on the sea surface of 25 g/m² (or greater), would be harmful for all birds that have landed in an oil film due to potential contamination of their feathers, with secondary effects such as loss of temperature regulation and ingestion of oil through preening (Scholten et al., 1996; Koops et al., 2004). The appearance of oil at this thickness is also described as metallic sheen (Bonn Agreement, 2009). For this study the high exposure threshold was set to 50 g/m² and above based on NOPSEMA (2019). This threshold can also be used to inform response planning.

Table 8.2 defines the thresholds used to classify the zones of floating oil exposure reported herein.

Table 8.1 The Bonn Agreement Oil Appearance Code.

Code	Description Appearance	Layer Thickness Interval (g/m ² or µm)	Litres per km ²
1	Sheen (silvery/grey)	0.04 – 0.30	40 – 300
2	Rainbow	0.30 – 5.0	300 – 5,000
3	Metallic	5.0 – 50	5,000 – 50,000
4	Discontinuous True Oil Colour	50 – 200	50,000 – 200,000
5	Continuous True Oil Colour	≥ 200	≥ 200,000

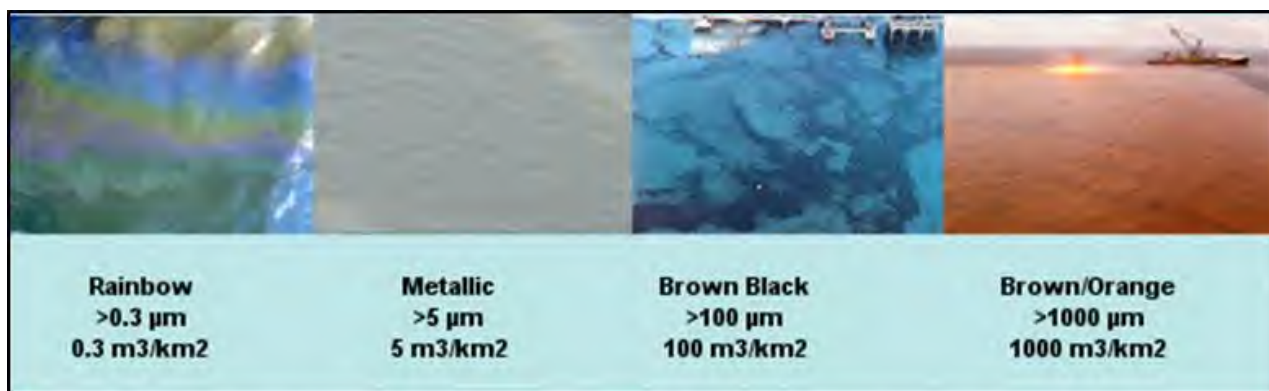


Figure 8.1 Photographs showing the difference between oil colour and thickness on the sea surface (source: adapted from Oil Spill Solutions, 2015).

Table 8.2 Floating oil exposure thresholds used in this report (in alignment with NOPSEMA (2019)).

Threshold level	Floating oil (g/m ²)	Description
Low	1	Approximates range of socio-economic effects and establishes planning area for scientific monitoring
Moderate	10	Approximates lower limit for harmful exposures to birds and marine mammals
High	50*	Approximates surface oil slick and informs response planning

* 50 g/m² also used to define the threshold for actionable floating oil.

8.2 Shoreline Accumulation

There are many different types of shorelines, ranging from cliffs, rocky beaches, sandy beaches, mud flats and mangroves, and each of these influences the volume of oil that can remain stranded ashore and its thickness before the shoreline saturation point occurs. For instance, a sandy beach may allow oil to percolate through the sand, thus increasing its ability to hold more oil ashore over tidal cycles and various wave actions than an equivalent area of water; hence oil can increase in thickness onshore over time. A sandy beach shoreline was assumed as the default shoreline type for the modelling in this study, as it allows for the highest carrying capacity of oil (of the available open/exposed shoreline types). Hence the results are considered conservative (i.e., worst-case) given that a large part of the shoreline in the study area (especially the western part of the Joseph Bonaparte Gulf) is characterised by exposed rocky shorelines, with southern parts characterised by tidal mudflats and mangroves and eastern shorelines containing more sandy beaches.

Previous risk assessment studies, French-McCay et al. (2005a; 2005b) used a threshold of 10 g/m² to assess the potential for shoreline accumulation. This is a conservative threshold used to define regions of socio-economic impact, such as triggering temporary closures of adjoining fisheries or the need for shore clean-up on beaches or man-made features/amenities (breakwaters, jetties, marinas, etc.). It would equate to approximately 2 teaspoons of hydrocarbon per square meter of shoreline accumulation. The appearance is described as a stain/film. On that basis, the 10 g/m² shoreline accumulation threshold has been selected to define the zone of potential “low shoreline accumulation”.

French et al. (1996) and French-McCay (2009) define a shoreline oil accumulation threshold of 100 g/m², or above, would potentially harm shorebirds and wildlife (fur-bearing aquatic mammals and marine reptiles on or along the shore) based on studies for sub-lethal and lethal impacts. This threshold has been used in previous environmental risk assessment studies (see French-McCay, 2003; French-McCay et al., 2004, French-McCay et al., 2011; 2012; NOAA, 2013). Additionally, a shoreline concentration of 100 g/m², or above, is the minimum concentration that the oil can be effectively cleaned according to AMSA (2015). This threshold equates to approximately ½ a cup of oil per square meter of shoreline accumulation. The

appearance is described as a thin oil coat. Therefore, 100 g/m² has been selected to define the zone of potential “moderate shoreline accumulation”.

Observations by Lin & Mendelsohn (1996) demonstrated that loadings of more than 1,000 g/m² of hydrocarbon during the growing season would be required to impact marsh plants significantly. Similar thresholds have been found in studies assessing hydrocarbon impacts on mangroves (Grant et al., 1993; Suprayogi & Murray, 1999). This loading equates to approximately 1 litre of hydrocarbon per square meter of shoreline accumulation and the appearance is described as a hydrocarbon cover. A loading of 1,000 g/m² has been selected to define the zone of potential “high shoreline accumulation”.

These shoreline accumulation thresholds derived from extensive literature review (outlined in Table 8.3) align with the threshold values for oil spill modelling specified in NOPSEMA (2019).

Table 8.3 Thresholds used to assess shoreline accumulation.

Threshold level	Shoreline loading (g/m ²)	Description
Low (socioeconomic/sublethal)	10	Predicts potential for some socio-economic impact
Moderate	100*	Loading predicts area likely to require clean-up effort
High	1,000	Loading predicts area likely to require intensive clean-up effort

* 100 g/m² also used to define the threshold for actionable shoreline oil.

8.3 In-water Exposure

Oil is a mixture of thousands of hydrocarbons of varying physical, chemical, and toxicological characteristics, and therefore, demonstrate varying fates and impacts on organisms. As such, for in-water exposure, the SIMAP model provides separate outputs for dissolved and entrained hydrocarbons from oil droplets. The consequences of exposure to dissolved and entrained components will differ because they have different modes and magnitudes of effect.

Entrained hydrocarbon concentrations were calculated based on oil droplets that are suspended in the water column, though not dissolved. The composition of this oil would vary with the state of weathering (oil age) and may contain soluble hydrocarbons when the oil is fresh. Calculations for dissolved hydrocarbons specifically calculates oil components which are dissolved in water, which are known to be the primary source of toxicity exerted by oil.

A complicating factor that should be considered when assessing the consequence of dissolved and entrained oil distributions is that there will be some areas where both physically entrained oil droplets and dissolved hydrocarbons co-exist. Higher concentrations of each will tend to occur close to the source where sea conditions can force mixing of relatively unweathered oil into the water column, resulting in more rapid dissolution of soluble compounds.

8.3.1 Dissolved Hydrocarbons

Laboratory studies have shown that dissolved hydrocarbons exert most of the toxic effects of oil on aquatic biota (Carls et al., 2008; Nordtug et al., 2011; Redman, 2015). The mode of action is a narcotic effect, which is positively related to the concentration of soluble hydrocarbons in the body tissues of organisms (French-McCay, 2002). Dissolved hydrocarbons are taken up by organisms directly from the water column by absorption through external surfaces and gills, as well as through the digestive tract. Thus, soluble hydrocarbons are termed “bioavailable”.

Hydrocarbon compounds vary in water-solubility and the toxicity exerted by individual compounds is inversely related to solubility, however bioavailability will be modified by the volatility of individual compounds (Nirmalakhandan & Speece, 1988; Blum & Speece, 1990; McCarty, 1986; McCarty et al., 1992a, 1992b;

McCarty & Mackay, 1993; Verhaar et al., 1992, 1999; Swartz et al., 1995; French-McCay, 2002; McGrath and Di Toro, 2009). Of the soluble compounds, the greatest contributor to toxicity for water-column and benthic organisms are the lower-molecular-weight aromatic compounds, which are both volatile and soluble in water. Although they are not the most water-soluble hydrocarbons within most oil types, the polynuclear aromatic hydrocarbons (PAHs) containing 2-3 aromatic ring structures typically exert the largest narcotic effects because they are semi-soluble and not highly volatile, so they persist in the environment long enough for significant accumulation to occur (Anderson et al., 1974, 1987; Neff & Anderson, 1981; Malins & Hodgins, 1981; McAuliffe, 1987; NRC, 2003). The monoaromatic hydrocarbons (MAHs), including the BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), and the soluble alkanes (straight chain hydrocarbons) also contribute to toxicity, but these compounds are highly volatile, so that their contribution will be low when oil is exposed to evaporation and higher when oil is discharged at depth where volatilisation does not occur (French-McCay, 2002).

French-McCay (2002) reviewed available toxicity data, where marine biota was exposed to dissolved hydrocarbons prepared from oil mixtures, finding that 95% of species and life stages exhibited 50% population mortality (LC₅₀) between 6 and 400 ppb total PAH concentration after 96 hrs exposure, with an average of 50 ppb. Hence, concentrations lower than 6 ppb total PAH value should be protective of 97.5% of species and life stages even with exposure periods of days (at least 96 hours). Early life-history stages of fish appear to be more sensitive than older fish stages and invertebrates.

Exceedances of 10, 50 or 400 ppb over a 1 hour timestep (see Table 8.4) were applied in this study to indicate the increasing potential for sub-lethal to lethal toxic effects (or low to high), based on NOPSEMA (2019).

8.3.2 Entrained Hydrocarbons

Entrained hydrocarbons consist of oil droplets that are suspended in the water column and insoluble. Insoluble compounds in oil cannot be absorbed from the water column by aquatic organisms, therefore they are not bioavailable through absorption of compounds from the water. Exposure to these compounds would require routes of uptake other than absorption of soluble compounds. The route of exposure of organisms to whole oil alone include direct contact with tissues of organisms and uptake of oil by direct consumption, with potential for biomagnification through the food chain (NRC, 2003).

The 10 ppb threshold corresponds generally with the lowest trigger levels for chronic exposure for entrained hydrocarbons in the ANZECC & ARMCANZ (2000) water quality guidelines. Due to the requirement for relatively long exposure times (> 24 hours) for these concentrations to accumulate, they are likely to be more meaningful for juvenile fish, larvae and planktonic organisms that might be entrained (or otherwise moving) within the entrained plumes, or when entrained hydrocarbons adhere to organisms or are trapped against a shoreline for periods of several days or more.

This exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill. This area does not define the area of influence as it is considered that the environment will not be affected by the entrained hydrocarbon at this level.

Thresholds of 10 ppb and 100 ppb were applied over a 1 hour time exposure (Table 8.4), to cover the range of thresholds outlined in ANZECC & ARMCANZ (2000) water quality guidelines and is per NOPSEMA (2019).

Table 8.4 Dissolved and entrained hydrocarbon exposure values assessed over a 1-hour time step, as per NOPSEMA (2019).

	Exposure level	In-water threshold (ppb)	Description
Dissolved hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	Moderate	50	Approximates potential toxic effects, particularly sublethal effects to sensitive species
	High	400	Approximates toxic effects including lethal effects to sensitive species
Entrained hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	High	100	As appropriate given oil characteristics for informing risk evaluation

8.4 Dispersion

A horizontal dispersion coefficient of 10 m²/s was used to account for dispersive processes acting at the surface that are below the scale of resolution of the input current field, based on typical values for open waters (Okubo, 1971). Dispersion rates within the water column (applicable for entrained and dissolved plumes of hydrocarbons) were specified at 1 m²/s, based on empirical data for the dispersion of hydrocarbon plumes (King & McAllister, 1998).

9 RECEPTORS

A range of environmental receptors and shorelines were assessed for floating oil exposure, shoreline contact and water column exposure (entrained and dissolved hydrocarbons) as part of the study (see Figure 9.1 to Figure 9.12). Receptor categories are shown in Table 9.1 which includes coastal and offshore islands grouped as shorelines. All other sensitive receptors other than submerged reefs, shoals and banks (RSB) were sourced from Australian Government Department of Agriculture, Water and the Environment (<http://www.environment.gov.au/>). Probabilities of exposure were separately calculated for each sensitive receptor area and have been tabulated.

Table 9.1 Summary of receptors assessed for potential oil exposure.

Receptor Category	Acronym	Hydrocarbon Exposure and Accumulation Assessment		
		Floating oil	Water Column	Shoreline
Australian Marine Park	AMP	✓	✓	✗
Biologically Important Area	BIA	✓	✓	✗
Conservation Park	CP	✓	✓	✗
Interim Biogeographic Regionalisation for Australia bioregions	IBRA	✓	✓	✗
Integrated marine and coastal regionalisation areas	IMCRA	✓	✓	✗
Marine National Parks	MNP	✓	✓	✗
Marine Park	MP	✓	✓	✗
Marine Sanctuary	MS	✓	✓	✗
National Park	NP	✓	✓	✗
National Parks Act Schedule 4 park or reserve	NPS4	✓	✓	✗
Nature Reserve	NR	✓	✓	✗
Ramsar Sites	Ramsar	✓	✓	✗
Reefs, Shoals and Banks	RSB	✓	✓	✗
Key Ecological Feature	KEF	✓	✓	✗
State Waters	State Waters	✓	✓	✗
Shorelines	Shore	✓ (Reported as: Nearshore Waters)	✓ (Reported as: Nearshore Waters)	✓

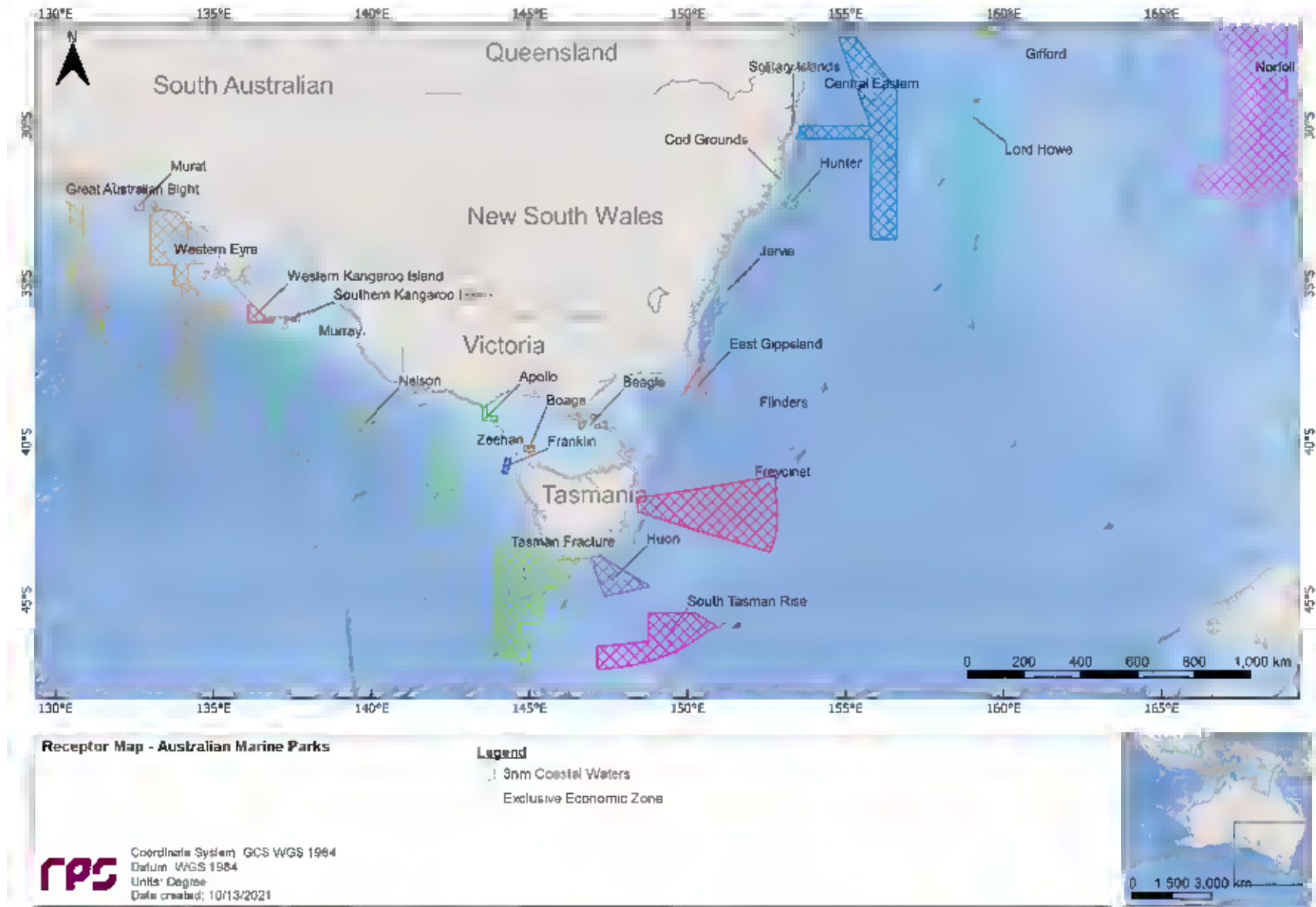


Figure 9.1 Receptor map for Australian Marine Parks (AMP).

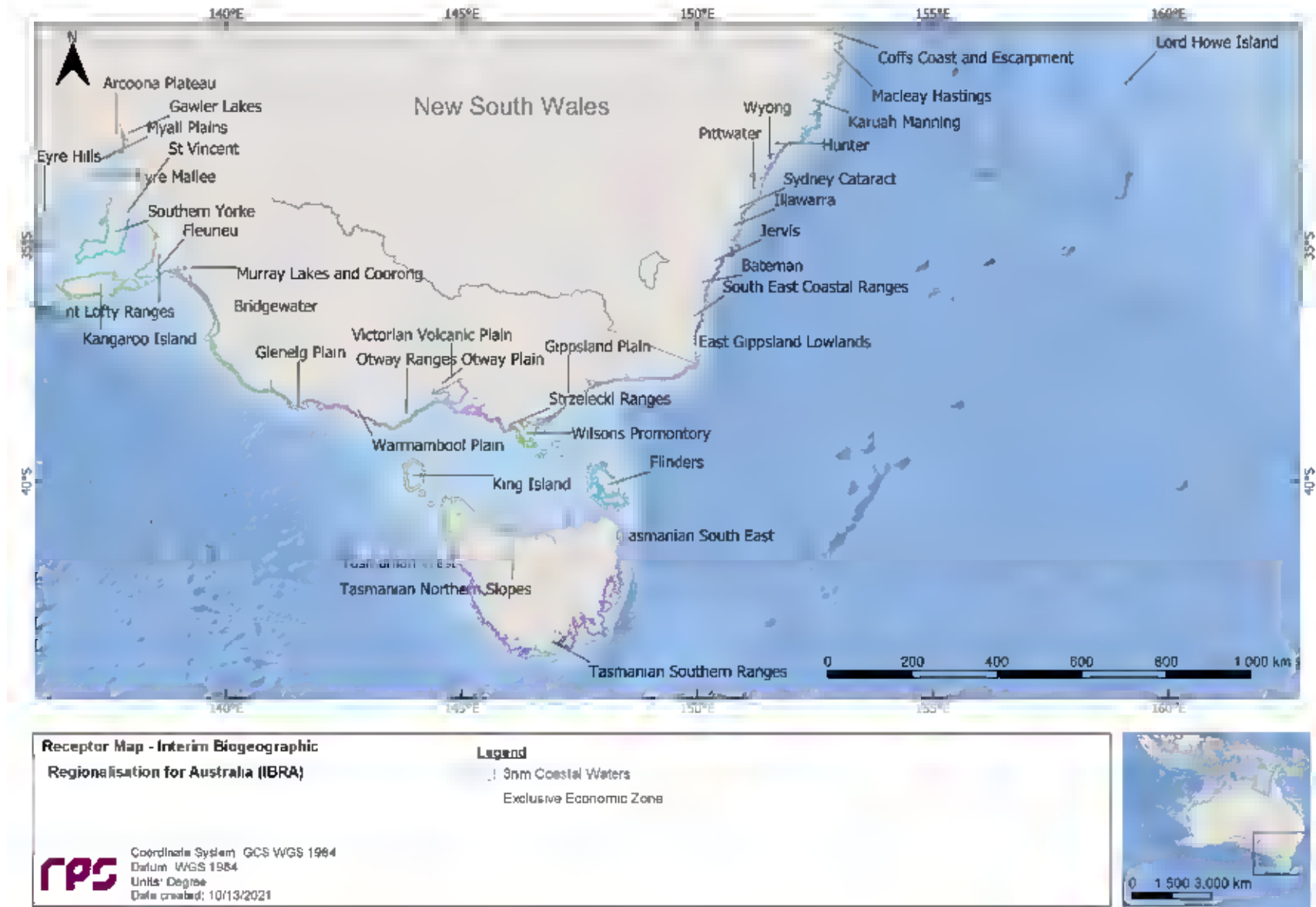


Figure 9.2 Receptor map for the Interim Biogeographic Regionalisation for Australia (IBRA) bioregions.

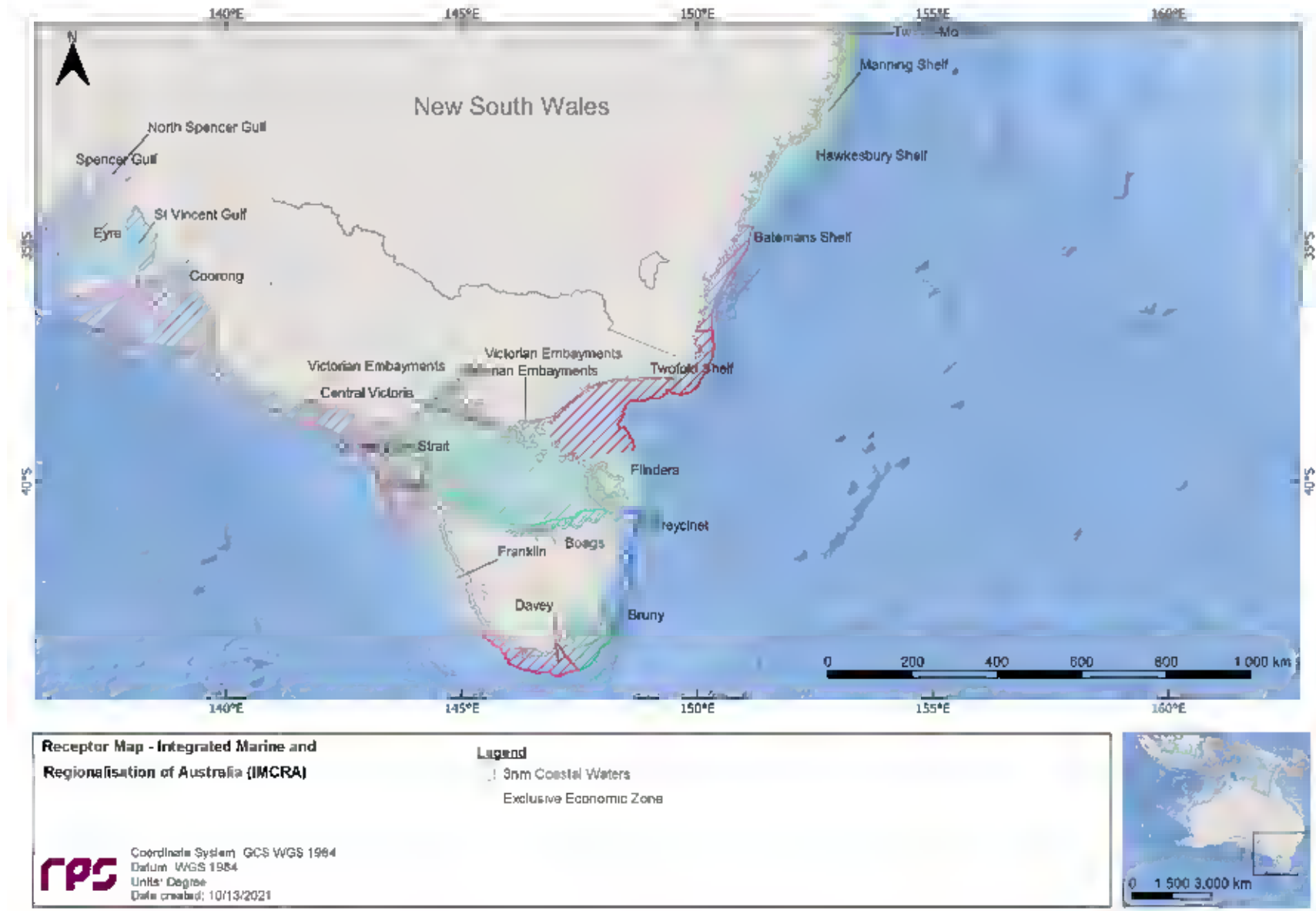


Figure 9.3 Receptor map for integrated marine and coastal regionalisation (IMCRA) areas.

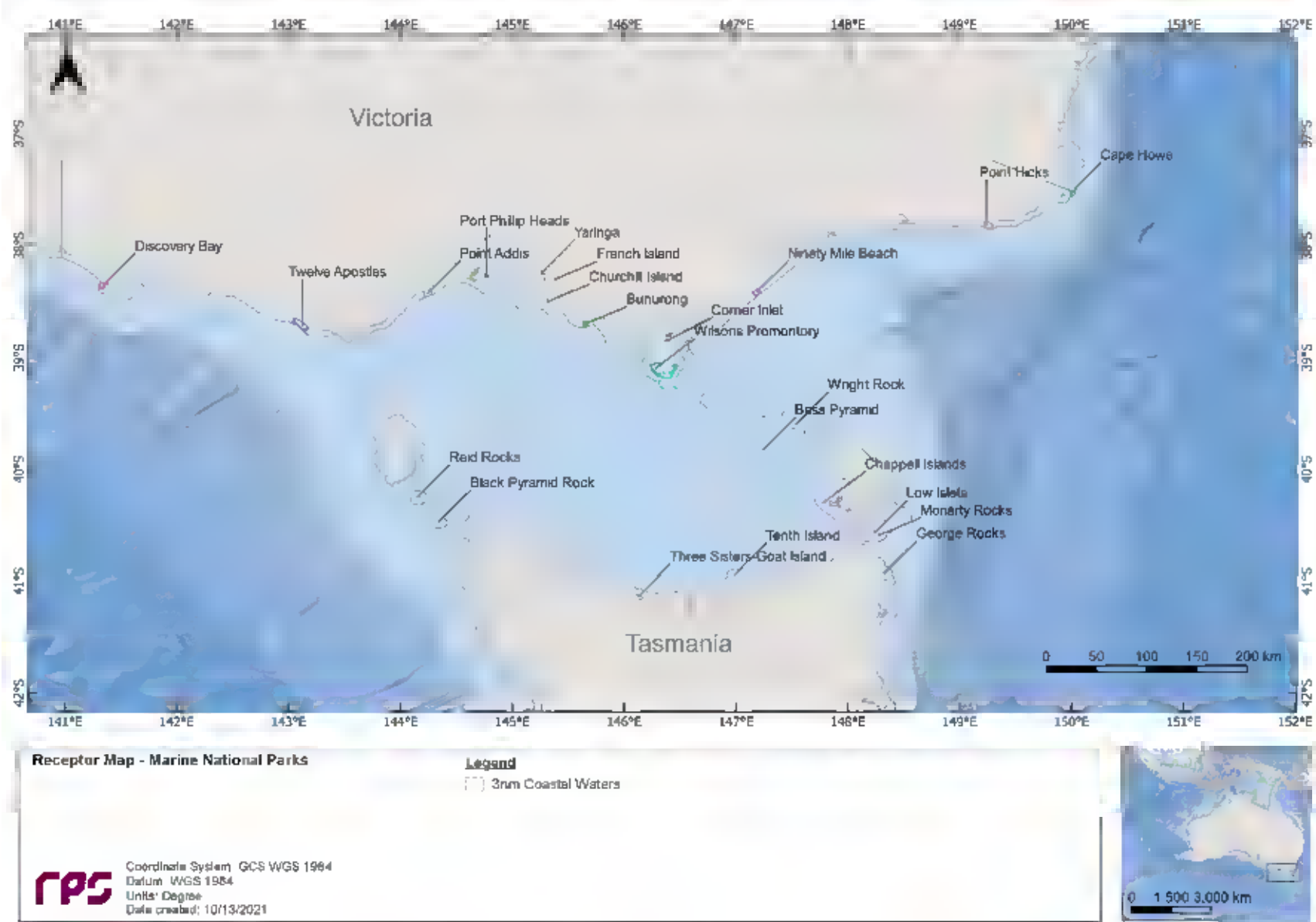


Figure 9.4 Receptor map for Marine National Parks (MNP).

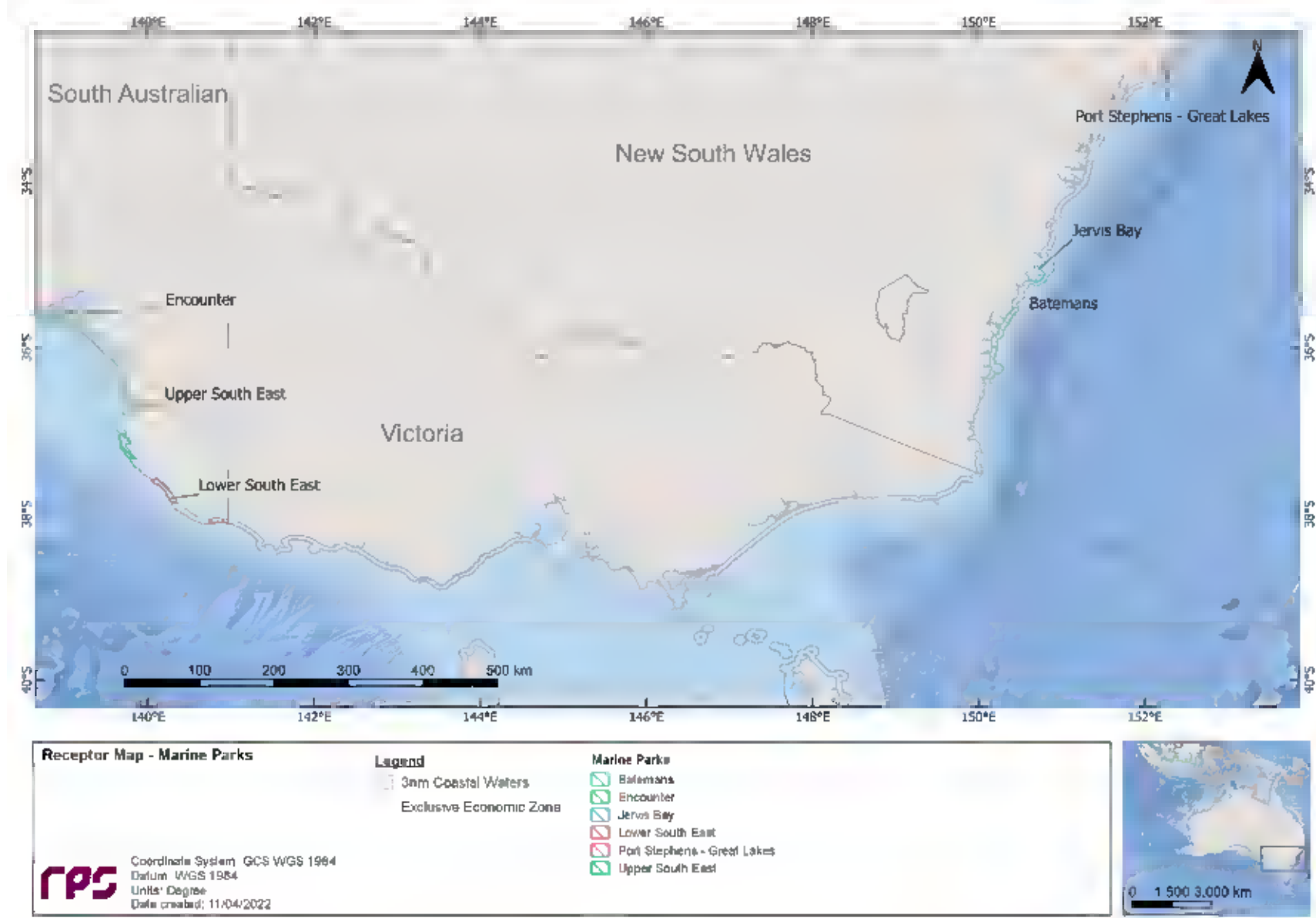


Figure 9.5 Receptor map for Marine Parks (MP).

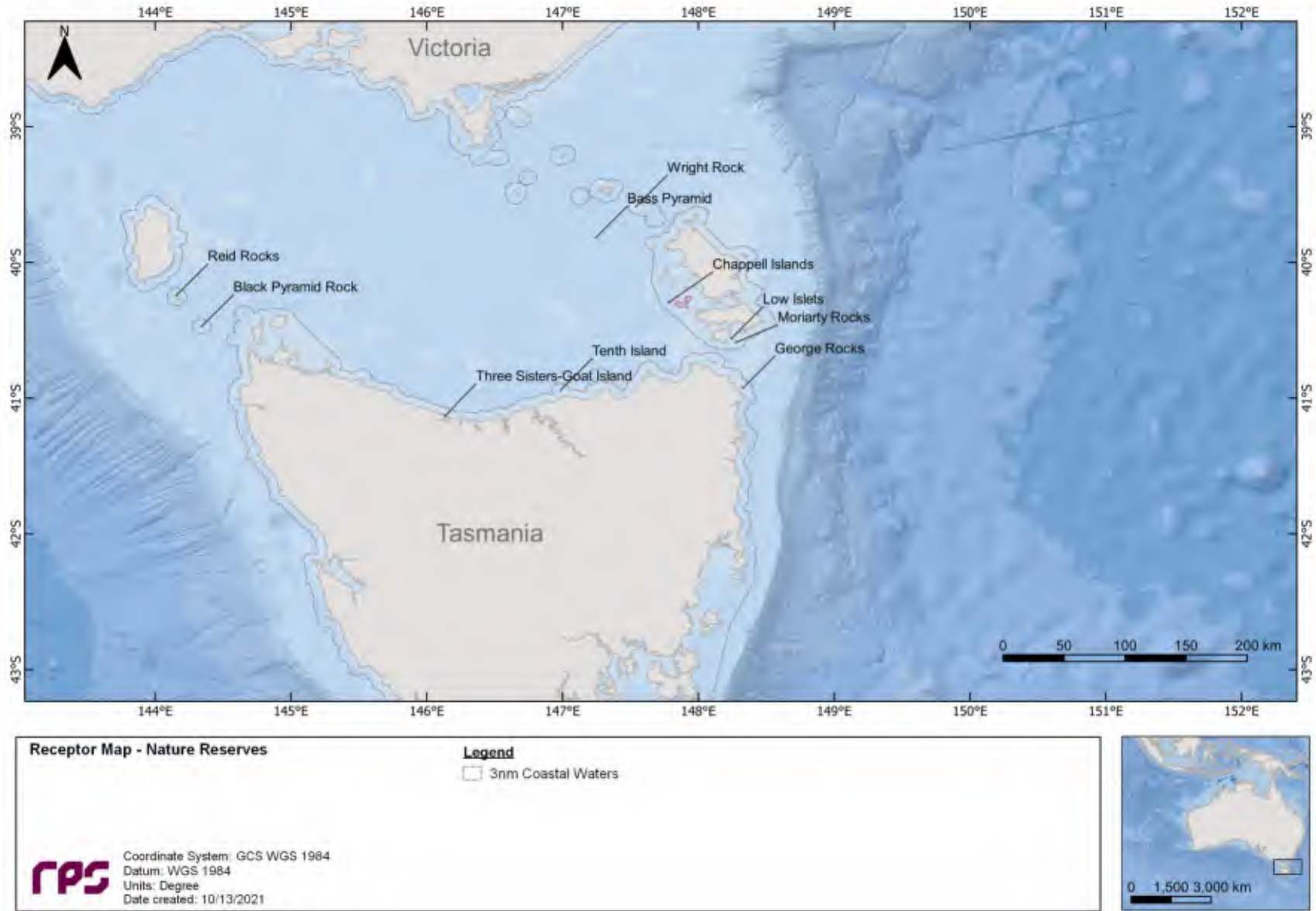


Figure 9.6 Receptor map for Nature Reserves (NR).

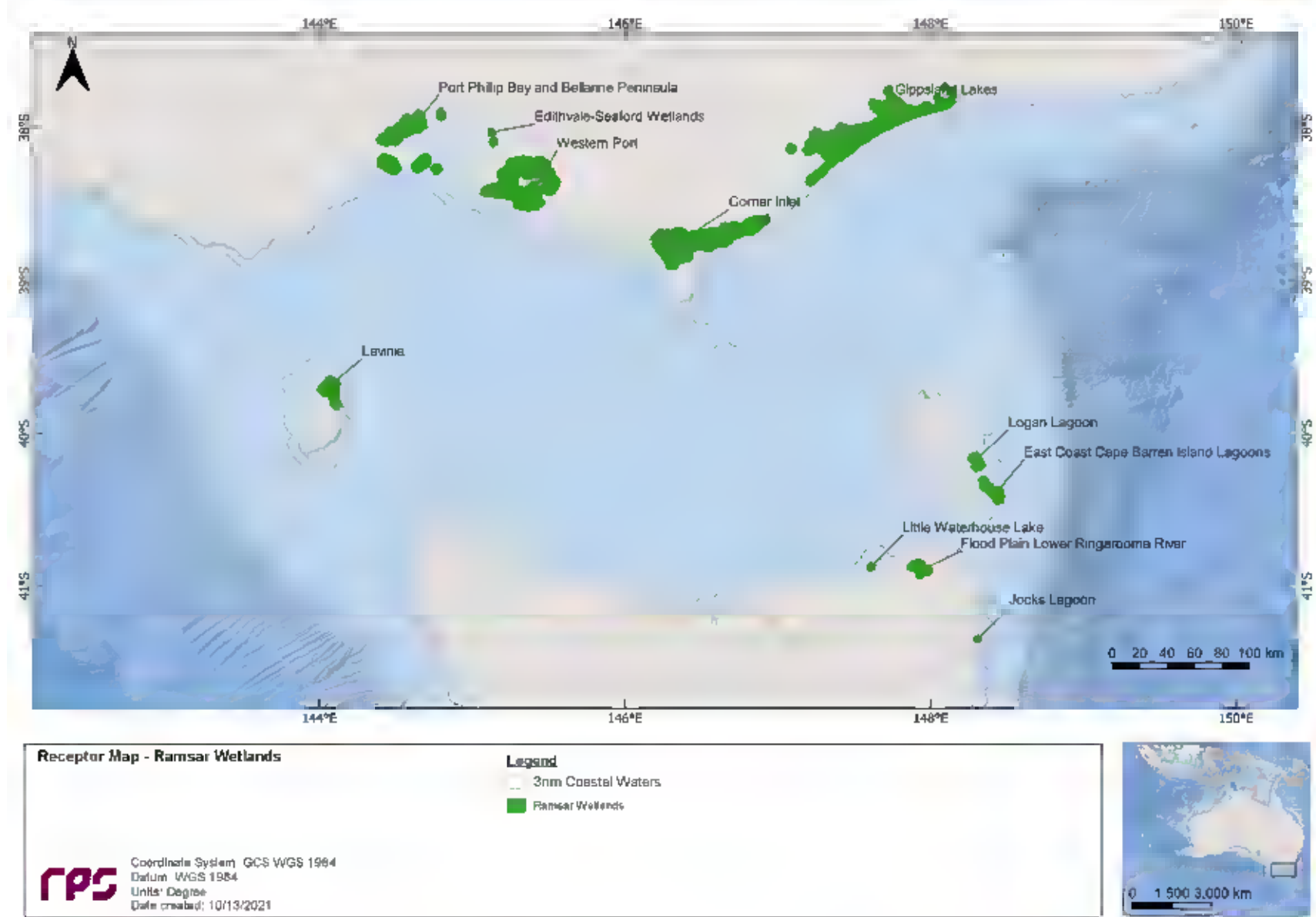


Figure 9.7 Receptor map for Ramsar Sites (Ramsar).

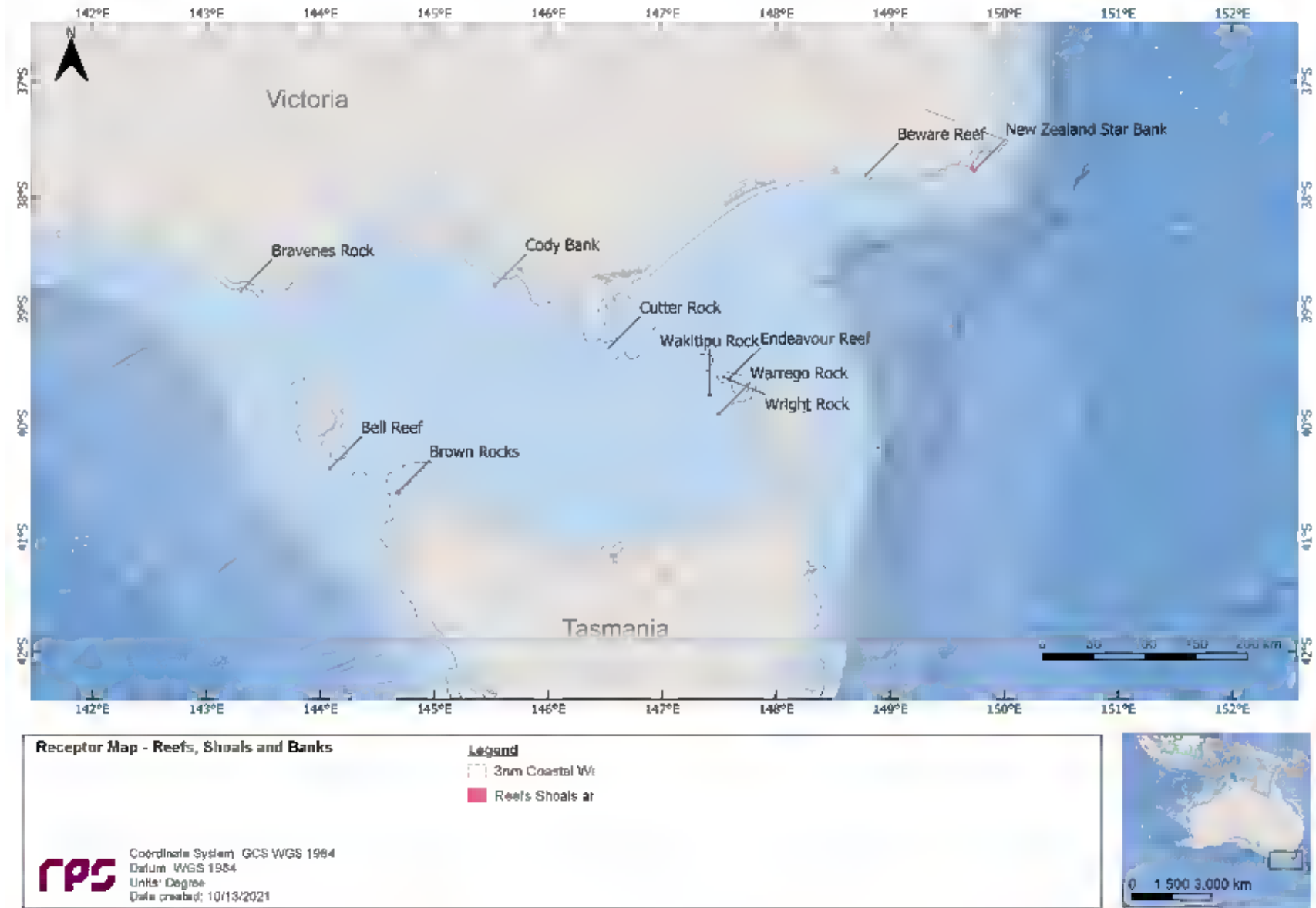


Figure 9.8 Receptor map for Reefs, Shoals and Banks (RSB).

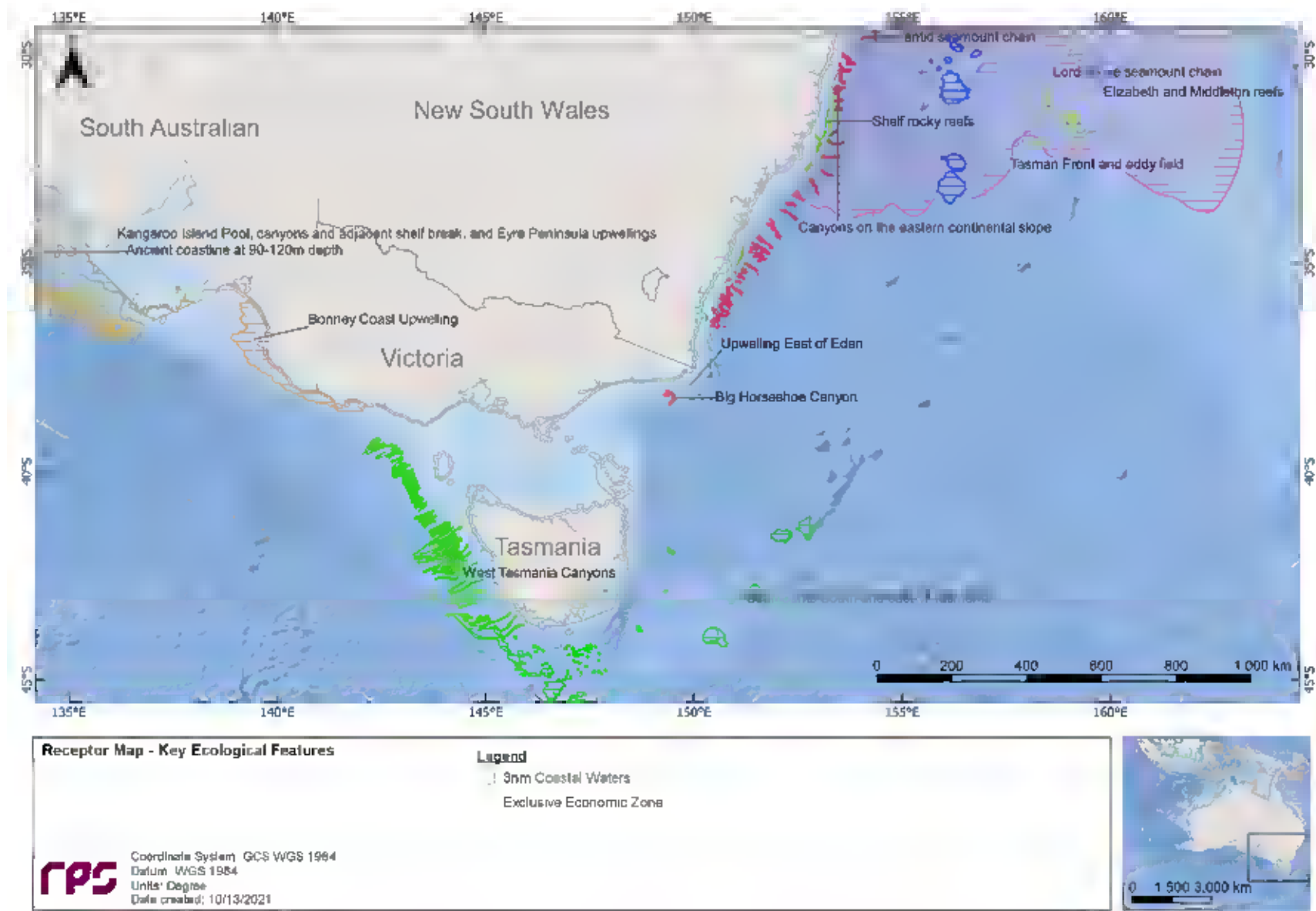


Figure 9.9 Receptor map for Key Ecological Features (KEF).

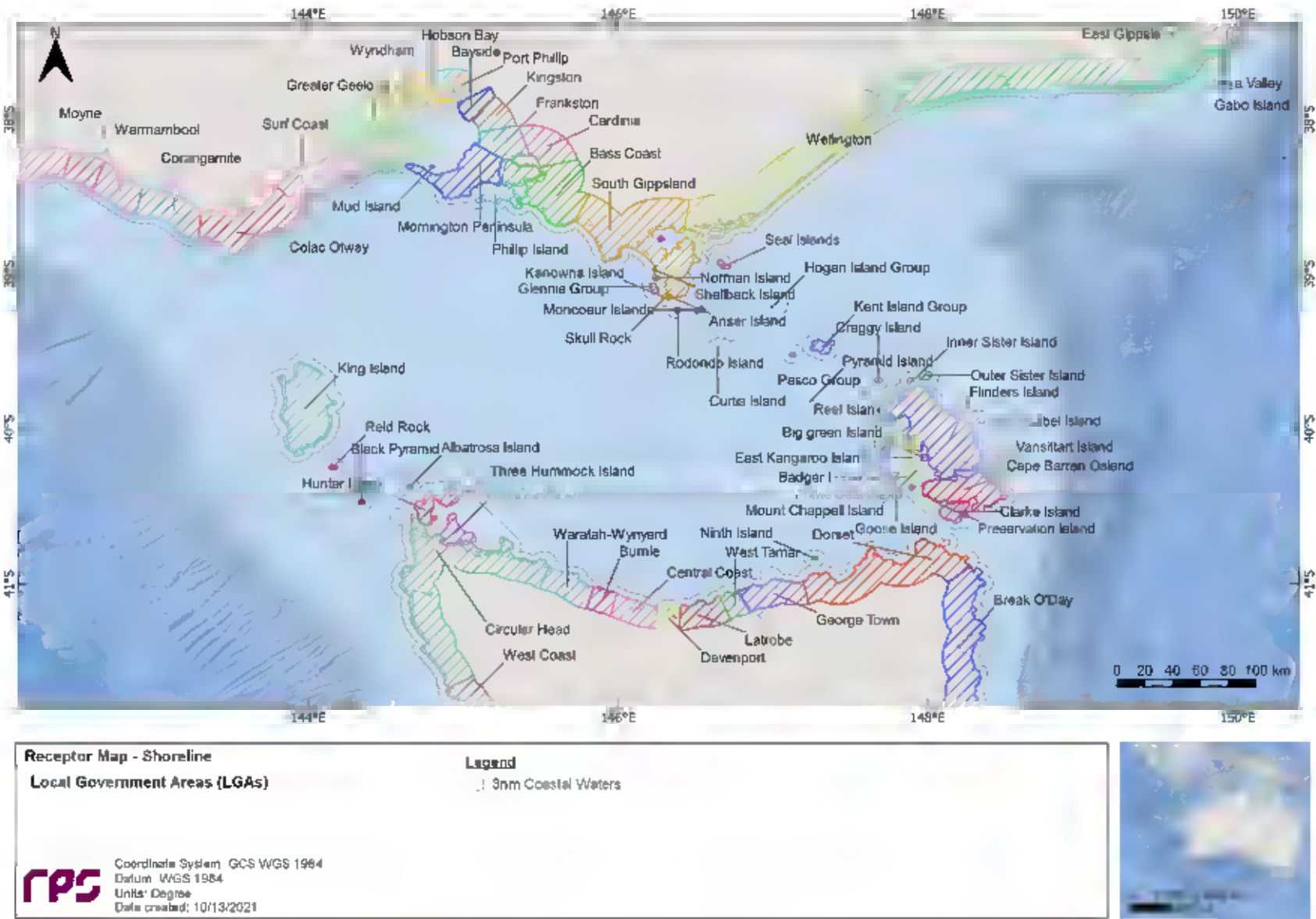


Figure 9.10 Receptor map for shorelines (1 of 3).

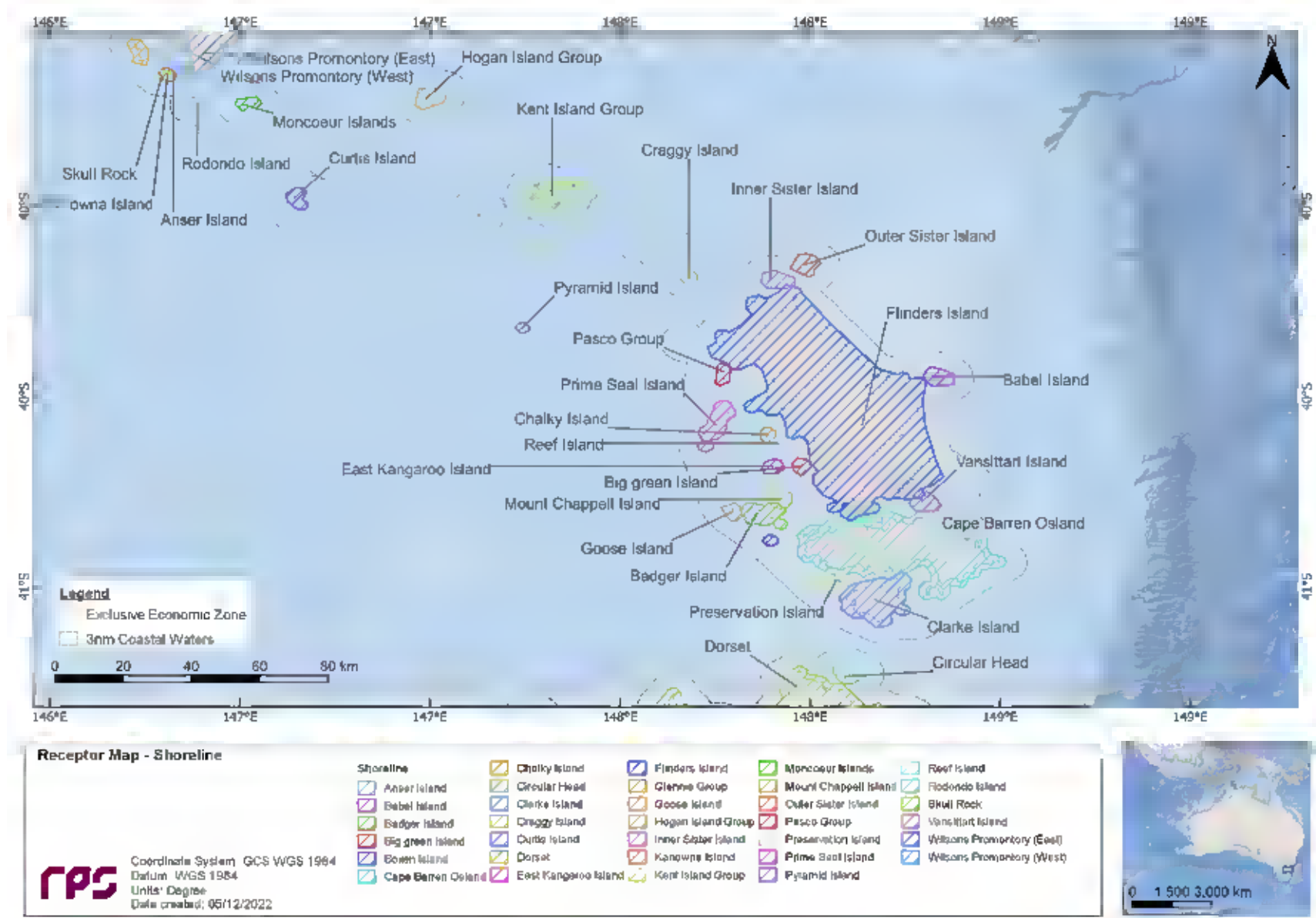


Figure 9.11 Receptor map for shorelines (2 of 3).

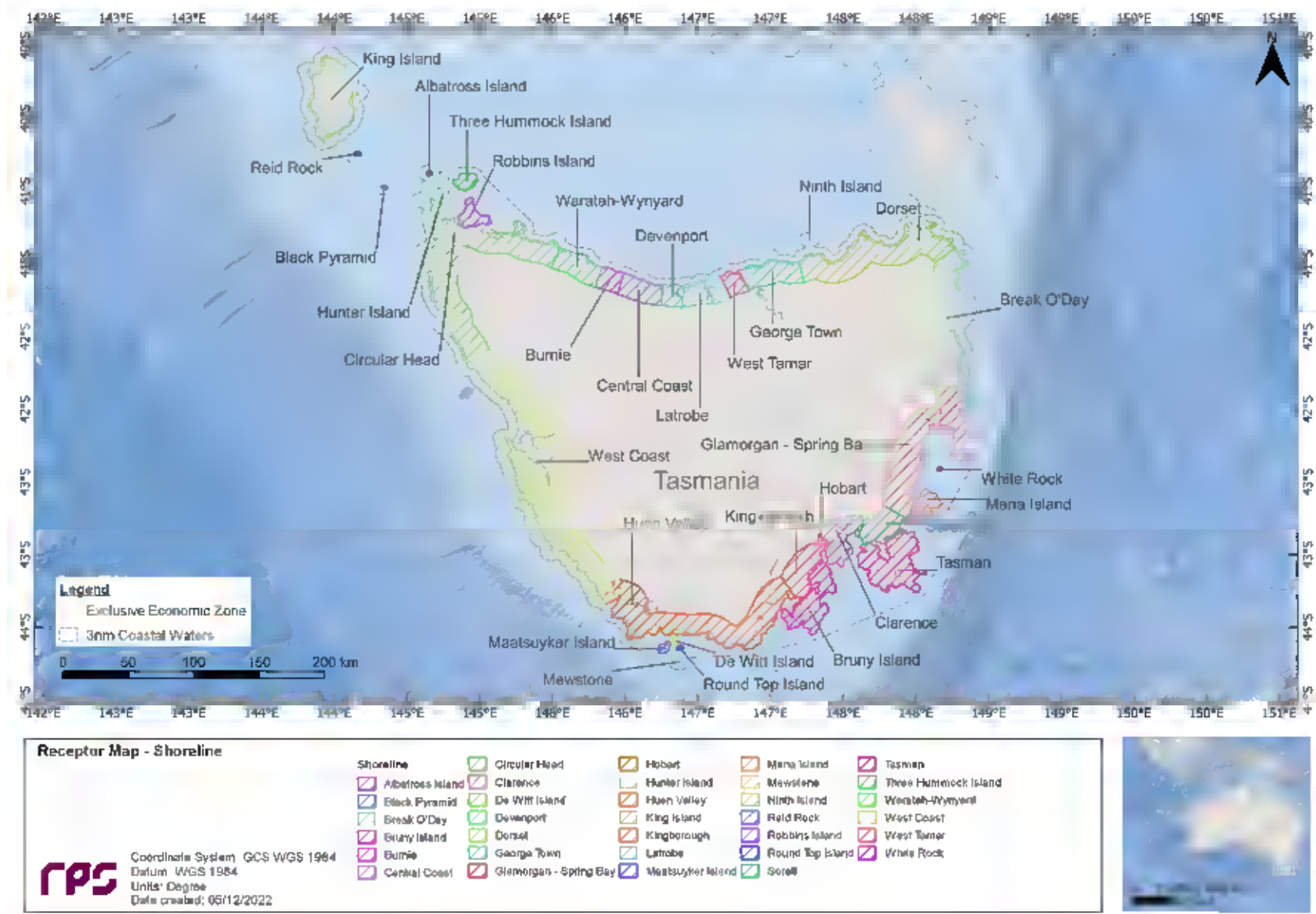


Figure 9.12 Receptor map for shorelines (3 of 3).

10 MODEL SETTINGS

Table 10.1 provides a summary of the spill modelling inputs and thresholds.

The potential risk of exposure to the surrounding waters and contact to shorelines was assessed for summer (October to March) and winter conditions (April to September).

The simulation length was carefully selected based on extensive sensitivity testing. During the sensitivity testing process, sample spill simulations were run for longer than intended durations. Upon completion of the spill simulations, the results were carefully assessed to examine the persistence of the hydrocarbon (i.e. whether the maximum evaporative loss has been achieved for the period of time modelled; and whether a substantial volume of hydrocarbons remain in the water column (if any)) in conjunction with the extent of floating oil exposure based on reporting thresholds. Once there was agreement between the two factors (i.e. the final fate of hydrocarbon is accounted for, and the full exposure area is identified) the simulation length was deemed appropriate.

Table 10.1 Summary of the of the oil spill modelling inputs and thresholds.

Parameter	Vessel collision
Number of release locations	3
Number of randomly selected spill start times per location and per season	100
Model period	Summer (October to March) and winter conditions (April to September)
Oil type	MDO
Total Spill volume (m ³)	350
Release type	Surface
Release duration	6 hours
Simulation length (days)	30
Floating oil exposure thresholds (g/m ²)	1 (low exposure) 10 (moderate exposure) 50 (high exposure)
Shoreline accumulation thresholds (g/m ²)	10 (low potential exposure) 100 (moderate potential exposure) 1,000 (high potential exposure)
Dissolved hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, potential low exposure) 50 (50 ppb x 1 hr, potential moderate exposure) 400 (400 ppb x 1 hr, potential high exposure)
Entrained hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, potential low exposure) 100 (100 ppb x 1 hr, potential high exposure)

11 CALCULATION OF EXPOSURE RISK

The stochastic sampling approach provides an objective measure of the possible outcomes of a spill because randomly selected environmental conditions with more simulations will tend to use the most commonly occurring conditions, while more unusual conditions will be represented less frequently.

During each simulation, the SIMAP model records the location (by latitude, longitude and depth) of each of the particles (representing a given mass of oil) on or in the water column, at regular time steps. For any particles that contact a shoreline, the model records the accumulation of oil mass that arrives on each section of shoreline over time, less any mass that is lost to evaporation and/or subsequent removal by current and wind forces.

The collective records from all simulations are then analysed by dividing the study region into a three-dimensional grid. For oil particles that are classified as being at the water surface (floating oil), the sum of the mass in all oil particles (including accounting for spreading and dispersion effects) located within a grid cell, divided by the area of the cell provides estimates of the concentration of oil in that grid cell, at each time step. For entrained and dissolved hydrocarbons particles, concentrations are calculated at each time step by summing the mass of particles within a grid cell and dividing by the volume of the grid cell.

The concentrations of oil calculated for each grid cell, at each time step, are then analysed to determine whether concentration estimates exceed defined threshold concentrations over time.

Risks are then summarised as follows:

- The probability of exposure to a location is calculated by dividing the number of spill simulations where any contact occurred above a specified threshold at that location by the total number of replicate spill simulations. For example, if contact occurred at a location (above a specified threshold) during 21 out of 100 simulations, a probability of exposure of 21% is indicated;
- The minimum potential time to a shoreline location is calculated by the shortest time over which oil at a concentration above a threshold was calculated to travel from the source to the location in any of the replicate simulations;
- The maximum potential concentration of oil predicted for each shoreline section is the greatest mass per m² of shoreline calculated to strand at any location within that section during any of the replicate simulations; and
- Similar treatments were undertaken for entrained and dissolved hydrocarbon exposures.

Thus, the minimum time to shoreline and the maximum potential concentration estimates indicate the worst potential outcome of the modelled spill scenario for each section of shoreline. However, the average over the replicates presents an average of the potential outcomes, in terms of hydrocarbons that could strand.

Note also that results quoted for sections of shoreline are derived for any individual location within that section, as a conservative estimate. Locations will represent shoreline lengths of the order of ~1 km, while sections or regions will represent shorelines spanning tens to hundreds of kilometres. The maximum potential concentrations quoted will not necessarily occur over the full extent of each section, therefore multiplying the maximum concentration estimates by the full area of the section is not recommended as this will greatly overestimate the total volume expected on that section.

12 LOCATION 1 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 1. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 30 days.

Section 12.1 presents the EMBA, Section 12.2 shows the seasonal (or stochastic) results, while Section 12.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

12.1 EMBA

Figure 12.1 shows the EMBA for Location 1. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

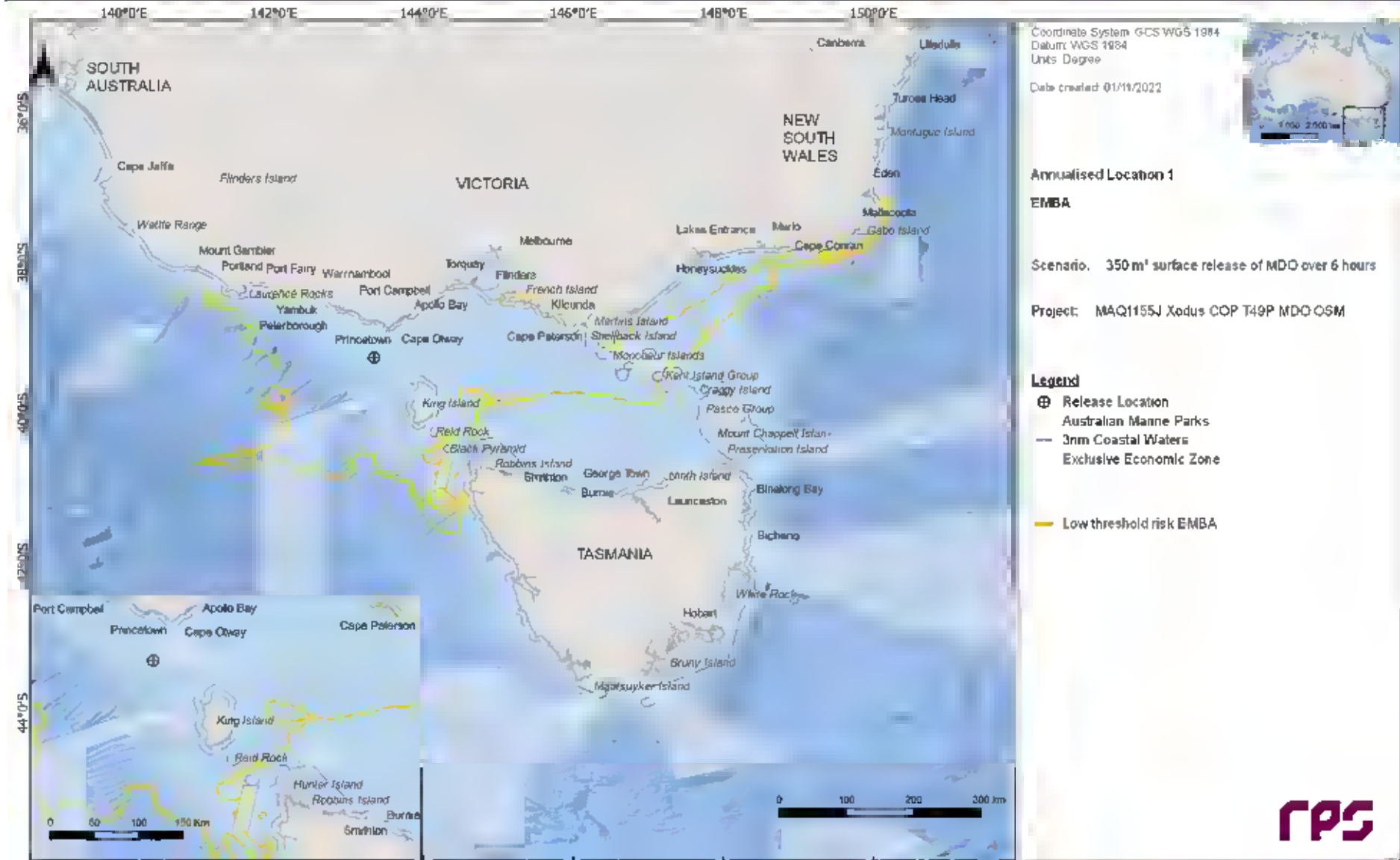


Figure 12.1 Predicted low threshold EMBA from a vessel collision at Location 1. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

12.2 Stochastic Analysis

12.2.1 Floating Oil Exposure

Table 12.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 12.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 12.2 to Figure 12.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer conditions was 129.5 km² and 135.0 km², respectively.

Table 12.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	29.7	15.5	4.0
	Maximum distance (km) from release location (99 th percentile)	19.4	14.7	4.0
	Direction	ENE	E	SW
Winter	Maximum distance (km) from release location	49.8	13.4	2.5
	Maximum distance (km) from release location (99 th percentile)	28.3	12.5	2.5
	Direction	E	S	ENE

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Table 12.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 1 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
AMP	Apollo	4	1	-	0.50	0.54	-	8	-	-	0.79	-	-
IMACRA	Central Bass Strait	-	-	-	-	-	-	1	-	-	3.33	-	-
	Otway	100	100	15	0.04	0.04	0.08	100	100	13	0.04	0.04	0.04

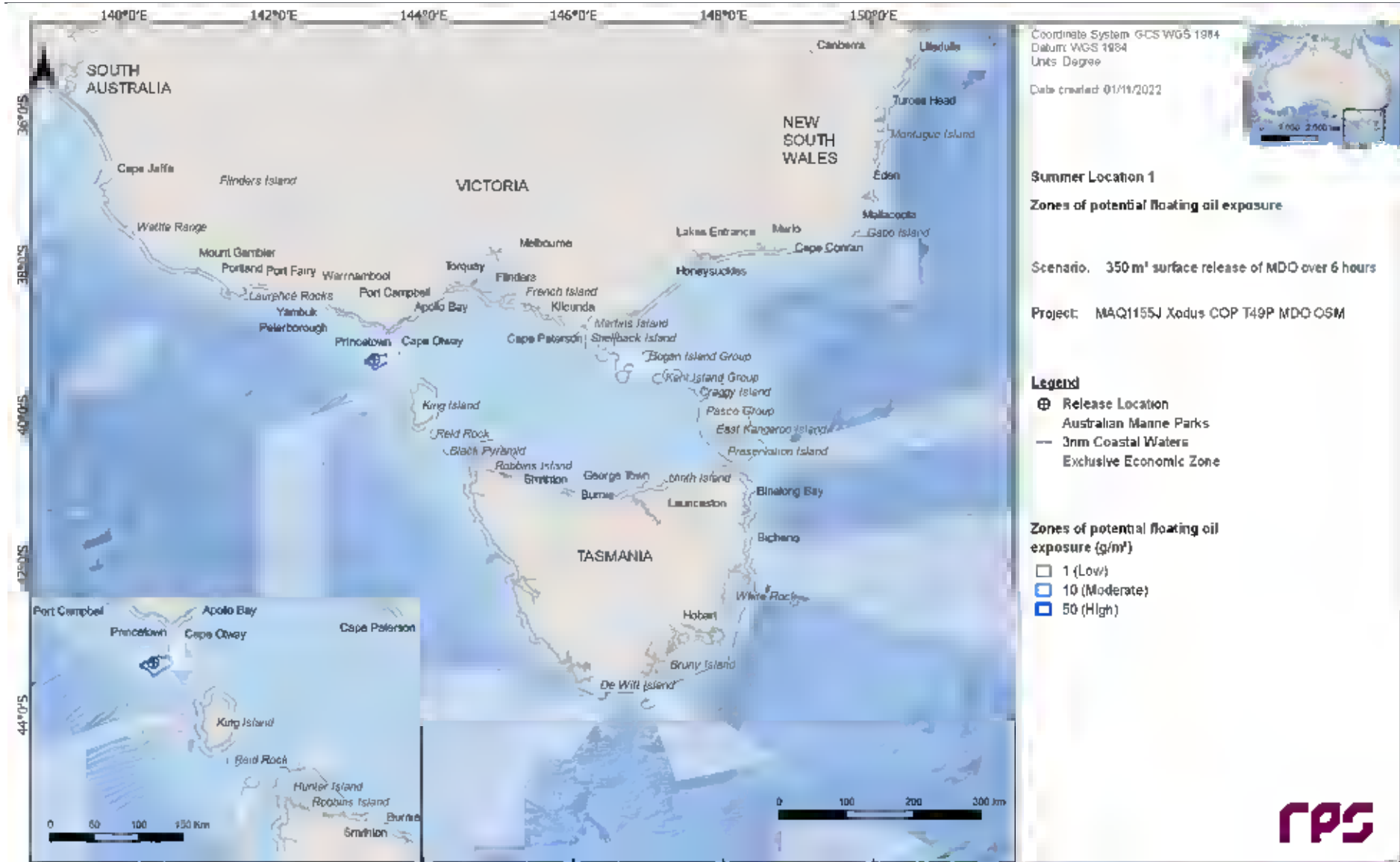


Figure 12.2 Zones of potential floating oil exposure from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

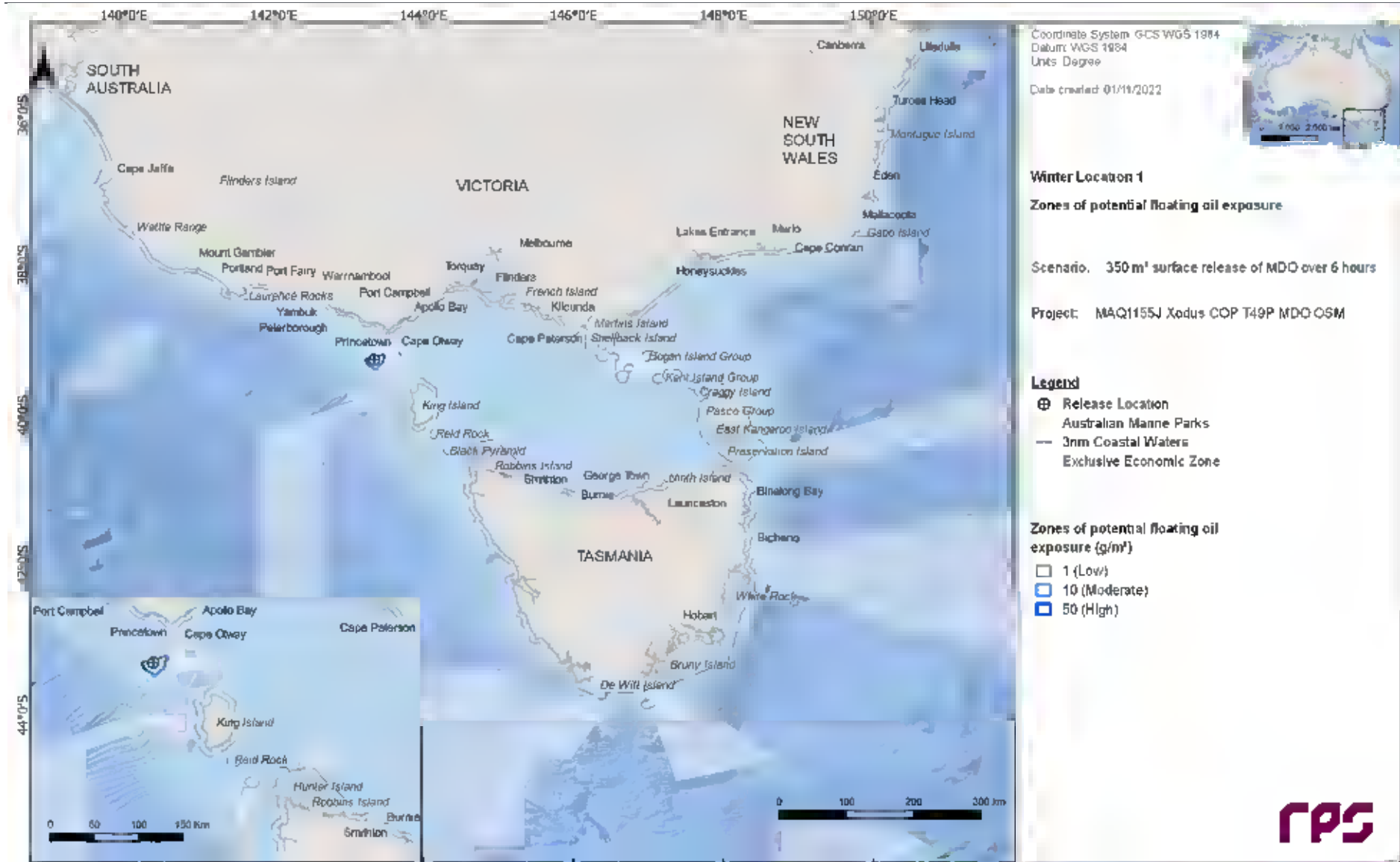


Figure 12.3 Zones of potential floating oil exposure from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

12.2.2 Shoreline Accumulation

Table 12.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 12.4 and Table 12.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 12.4 and Figure 12.5.

Table 12.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 1 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	10	12
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	11.17	4.25
Maximum volume of hydrocarbons ashore (m ³)	3.8	8.2
Average volume of hydrocarbons ashore (m ³)	2	2.1
Maximum length of the shoreline at 10 g/m² (km)	12	21
Average shoreline length (km) at 10 g/m² (km)	6.7	5.8
Maximum length of the shoreline at 100 g/m² (km)	-	1
Average shoreline length (km) at 100 g/m² (km)	-	1
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 12.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 1 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Bass Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colac Otway	5	-	-	13.46	-	-	17	38	0.8	2.8	5.4	-	-	9.6	-	-
Corangamite	1	-	-	13.58	-	-	21	21	1	1	3.8	-	-	3.8	-	-
Glenelg	1	-	-	18.00	-	-	21	21	1.6	1.6	7.6	-	-	7.6	-	-
Hogan Island Group	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
King Island	1	-	-	11.17	-	-	27	27	2	2	8.6	-	-	8.6	-	-
Laurence Rocks	1	-	-	18.92	-	-	18	18	0.3	0.3	1	-	-	1	-	-
Mornington Peninsula	1	-	-	25.75	-	-	15	15	1.3	1.3	3.8	-	-	3.8	-	-
Moyne	3	-	-	20.42	-	-	15	23	0.3	2.1	2.9	-	-	6.7	-	-
Norman Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phillip Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Gippsland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Surf Coast	1	-	-	16.42	-	-	26	26	1.4	1.4	3.8	-	-	3.8	-	-

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Table 12.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 1 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Bass Coast	1	-	-	16.46	-	-	13	13	0.6	0.6	1.9	-	-	1.9	-	-
Colac Otway	3	1	-	4.46	8.63	-	26	102	1.3	8.1	13.4	1	-	20.1	1	-
Corangamite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenelg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hogan Island Group	3	-	-	12.46	-	-	16	21	0.2	0.9	2.2	-	-	3.8	-	-
King Island	3	-	-	4.25	-	-	16	27	0.2	1.3	2.2	-	-	2.9	-	-
Laurence Rocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mornington Peninsula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moyne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norman Island	1	-	-	21.17	-	-	43	43	0.9	0.9	1.9	-	-	1.9	-	-
Phillip Island	1	-	-	17.13	-	-	12	12	0.4	0.4	1	-	-	1	-	-
South Gippsland	2	-	-	21.42	-	-	17	37	0.3	2.4	4.8	-	-	8.6	-	-
Surf Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

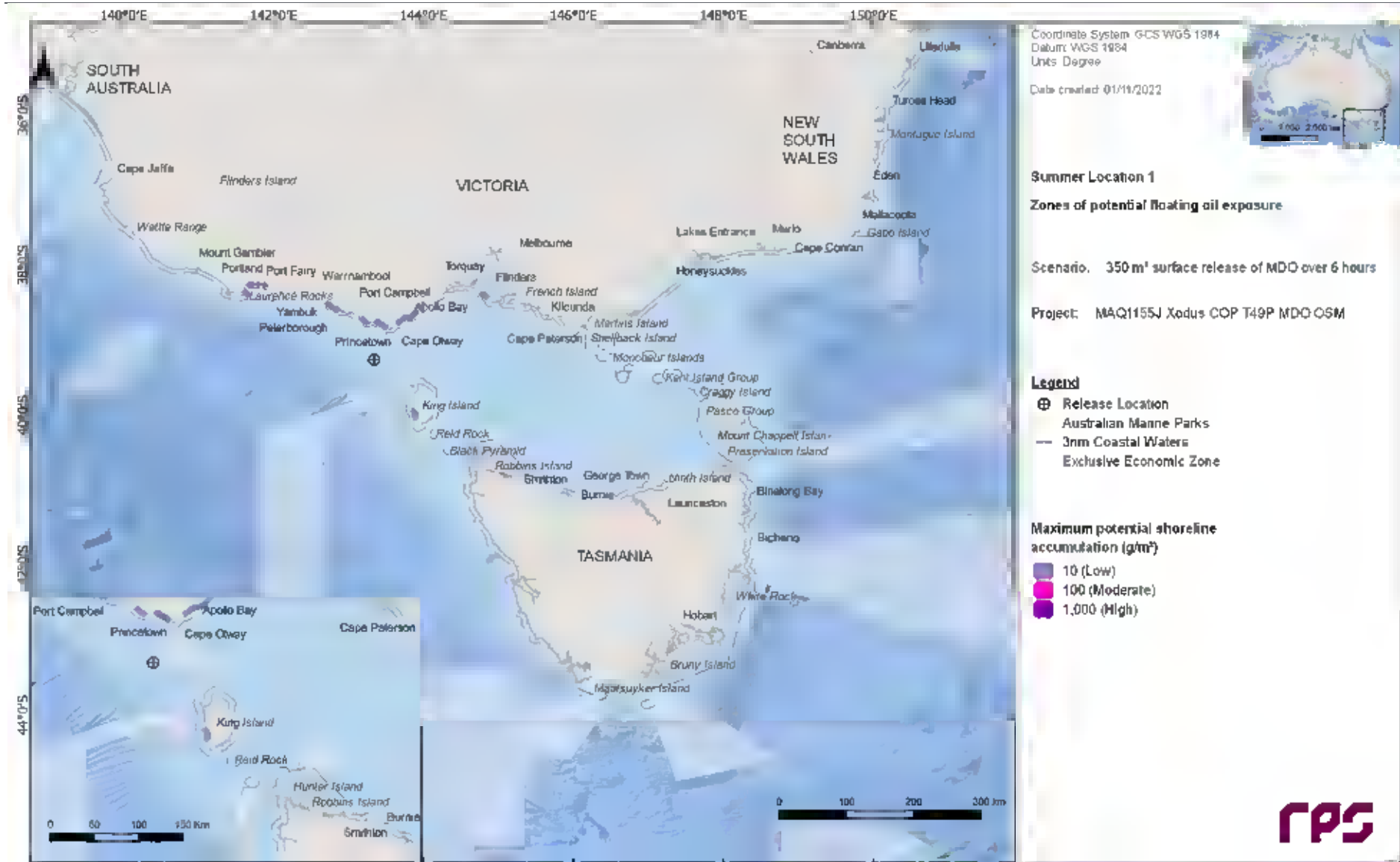


Figure 12.4 Maximum potential shoreline loading from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

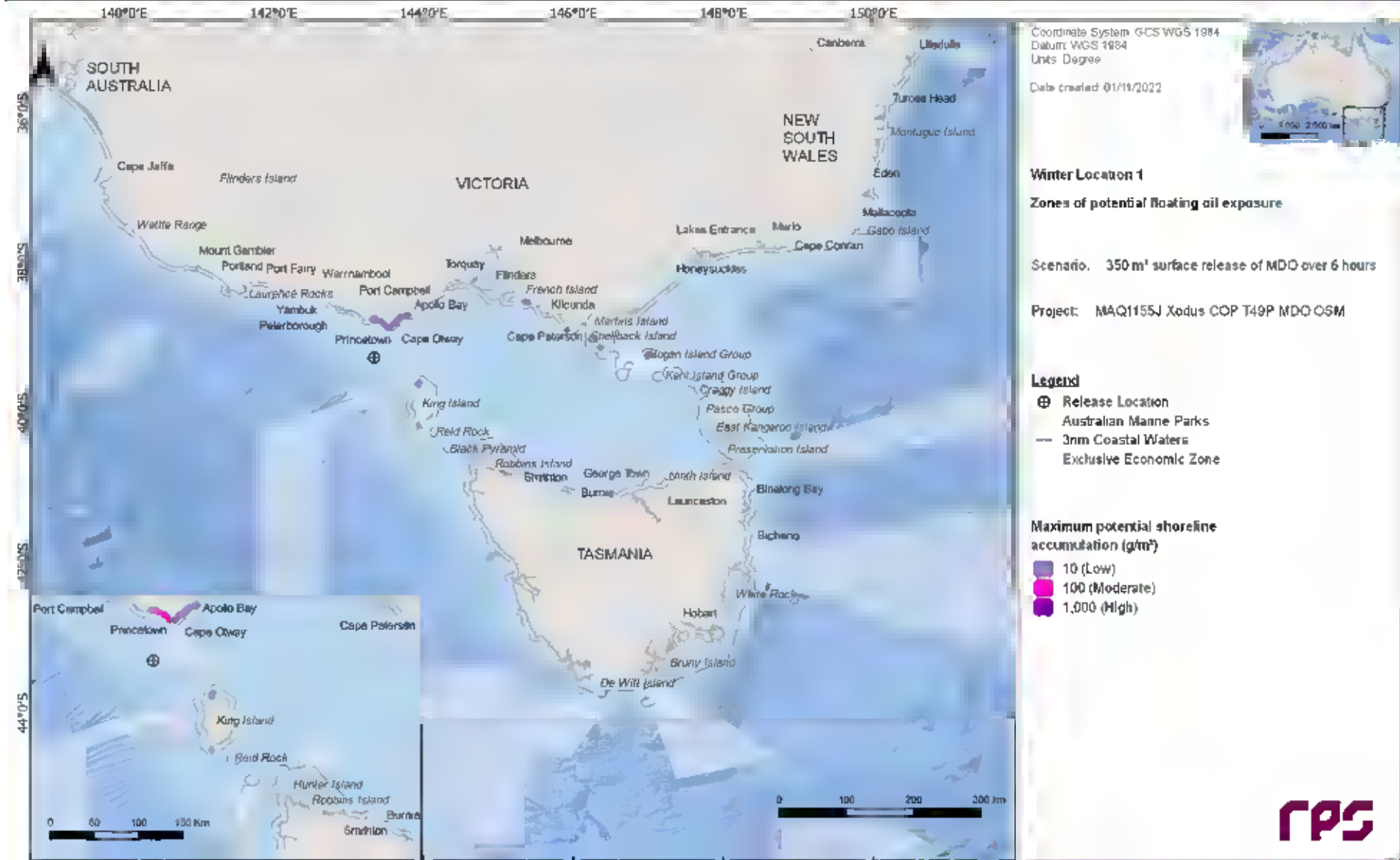


Figure 12.5 Maximum potential shoreline loading from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

12.2.3 In-water exposure

12.2.3.1 Dissolved Hydrocarbons

Table 12.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 12.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 12.6 and Figure 12.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 12.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	64	12	-
	Maximum distance (km) from release location (99 th percentile)	49	12	-
	Direction	SW	ENE	-
Winter	Maximum distance (km) from release location	92	11	-
	Maximum distance (km) from release location (99 th percentile)	71	11	-
	Direction	E	ENE	-

Table 12.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer					Winter		
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High rate
AMP	Apollo	46	7	-	-	40	8	-	-
IMCRA	Central Bass Strait	36	3	-	-	28	3	-	-
	Central Victoria	2	-	-	-	15	1	-	-
	Otway	87	59	8	-	80	54	5	-
KEF	West Tasmania Canyons	20	1	-	-	-	-	-	-
State Waters	Tasmania	1	-	-	-	11	1	-	-

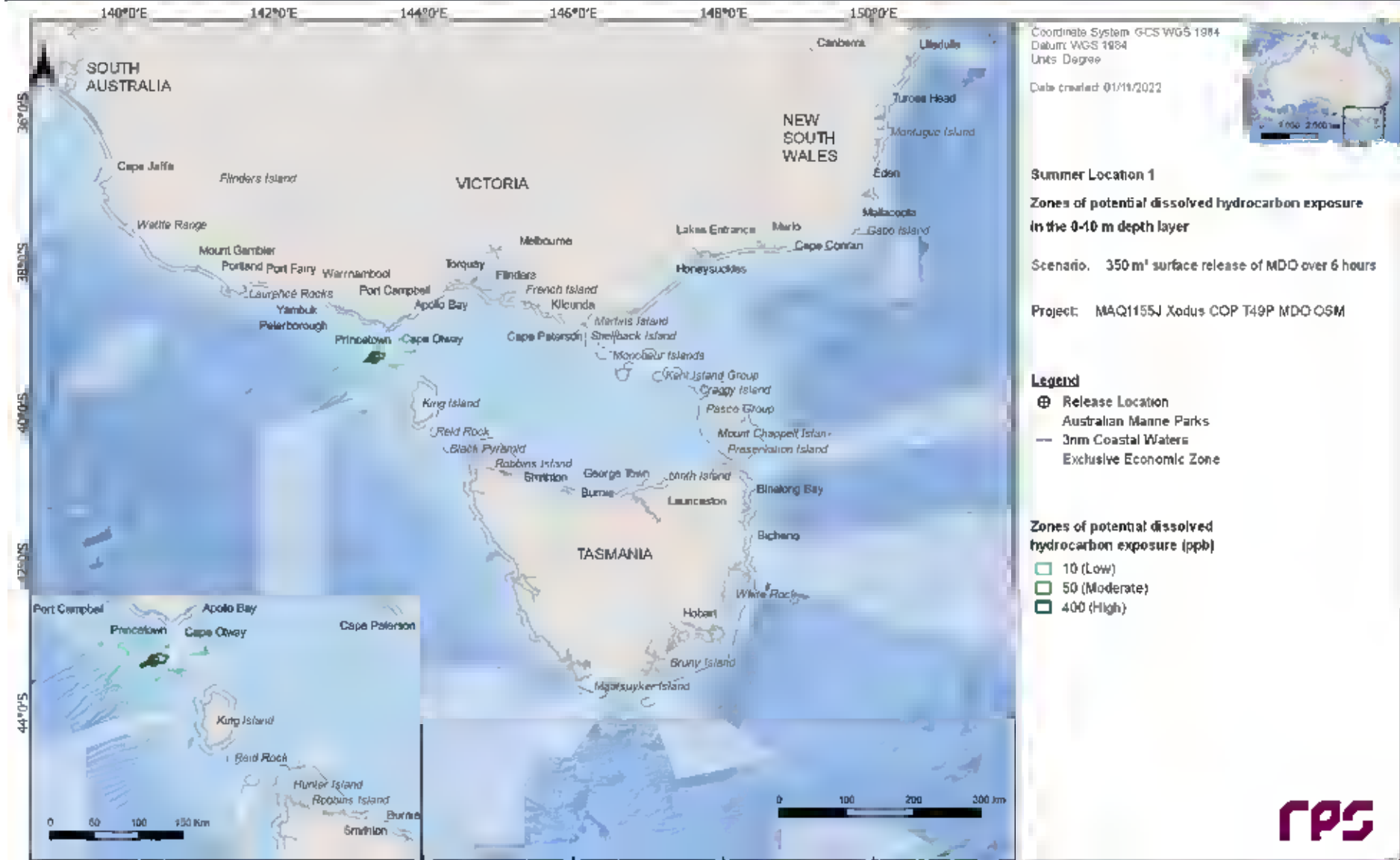


Figure 12.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

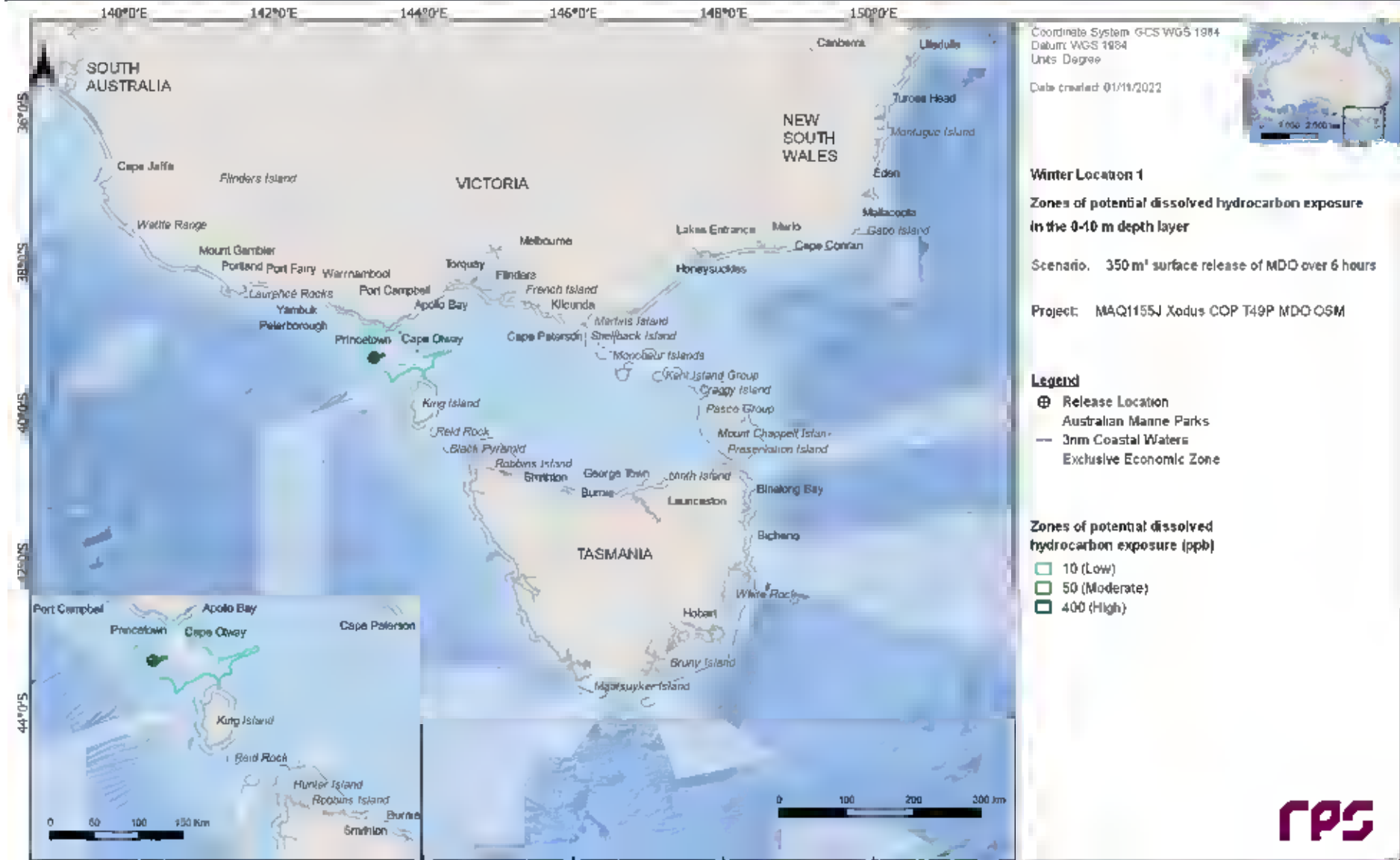


Figure 12.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

12.2.3.2 Entrained Hydrocarbons

Table 12.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 12.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 12.8 and Figure 12.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 12.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	282	113
	Maximum distance (km) from release location (99 th percentile)	255	93
	Direction	E	E
Winter	Maximum distance (km) from release location	648	148
	Maximum distance (km) from release location (99 th percentile)	520	131
	Direction	ENE	E

Table 12.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	2,789	46	27	1,419	55	35
	Beagle	11	1	-	38	8	-
	Franklin	12	1	-	14	1	-
	Zeehan	117	11	1	73	5	-
IBRA	Bridgewater	25	1	-	-	-	-
	Flinders	1	-	-	33	7	-
	Gippsland Plain	30	3	-	40	1	-
	Glenelg Plain	27	1	-	-	-	-
	King Island	70	6	-	120	7	1
	Otway Plain	54	5	-	160	4	1
	Otway Ranges	49	5	-	160	4	1
	Strzelecki Ranges	6	-	-	11	1	-
	Warrnambool Plain	44	3	-	19	1	-
	Wilson's Promontory	21	2	-	28	6	-
	IMCRA	Central Bass Strait	678	30	14	793	37
Central Victoria		179	18	1	351	13	5
Flinders		22	2	-	40	9	-
Franklin		21	1	-	14	1	-
Otway		7,449	98	96	7,283	98	92
Twofold Shelf		6	-	-	36	7	-
Victorian Embayments		20	3	-	40	1	-
KEF	Bonney Coast Upwelling	30	4	-	-	-	-
	Upwelling East of Eden	-	-	-	15	2	-
	West Tasmania Canyons	330	12	3	26	2	-
MNP	Churchill Island	3	-	-	31	1	-
	Point Addis	28	2	-	5	-	-
	Port Phillip Heads	15	3	-	1	-	-
	Twelve Apostles	39	3	-	12	1	-
	Wilson's Promontory	20	2	-	14	2	-
MS	Marengo Reefs	21	3	-	139	3	1
	The Arches	15	1	-	-	-	-
NP	Kent Group	-	-	-	11	1	-
NPS4	Bunurong Marine Park	2	-	-	14	1	-
	Wilson's Promontory Marine Park	8	-	-	20	1	-
	Wilson's Promontory Marine Reserve	14	2	-	13	1	-
Ramsar	Lavinia	2	-	-	13	1	-

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	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	15	1	-	-	-	-
	Western Port	5	-	-	31	1	-
RSB	Bell Reef	25	2	-	17	1	-
	Bravenes Rock	43	5	-	23	1	-
	Cody Bank	7	-	-	12	2	-
	Cutter Rock	2	-	-	31	7	-
	Anser Island	19	1	-	11	1	-
	Bass Coast	4	-	-	40	1	-
	Colac Otway	54	5	-	160	4	1
	Corangamite	44	3	-	39	1	-
	Curtis Island	1	-	-	24	5	-
	Glenelg	27	1	-	-	-	-
	Glennie Group	19	2	-	13	1	-
	Greater Geelong	17	3	-	-	-	-
	Hogan Island Group	-	-	-	32	7	-
	Kanowna Island	19	2	-	12	1	-
	Kent Island Group	1	-	-	11	1	-
Nearshore Waters	King Island	70	6	-	120	7	1
	Laurence Rocks	25	1	-	-	-	-
	Moncoeur Islands	7	-	-	28	5	-
	Mornington Peninsula	30	3	-	8	-	-
	Moyne	25	3	-	-	-	-
	Norman Island	11	2	-	19	1	-
	Phillip Island	17	2	-	40	1	-
	Reid Rock	24	2	-	17	2	-
	Rodondo Island	12	2	-	21	6	-
	Shellback Island	8	-	-	19	1	-
	Skull Rock	21	2	-	12	1	-
	South Gippsland	16	1	-	21	1	-
	Surf Coast	20	2	-	2	-	-
	Warrnambool	11	1	-	-	-	-
	State Waters	Tasmania	91	6	-	198	19
Victoria		54	6	-	219	7	1

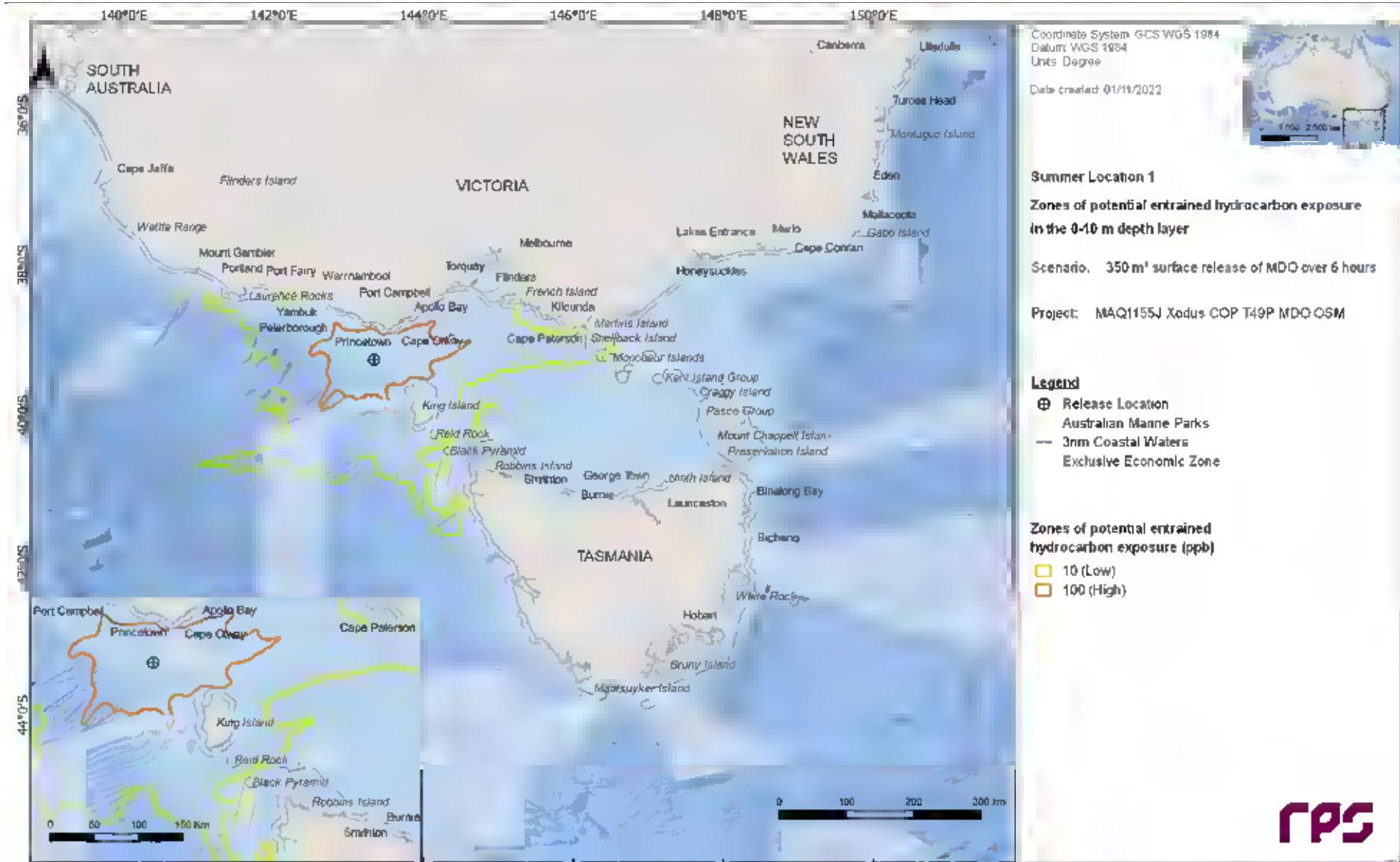


Figure 12.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

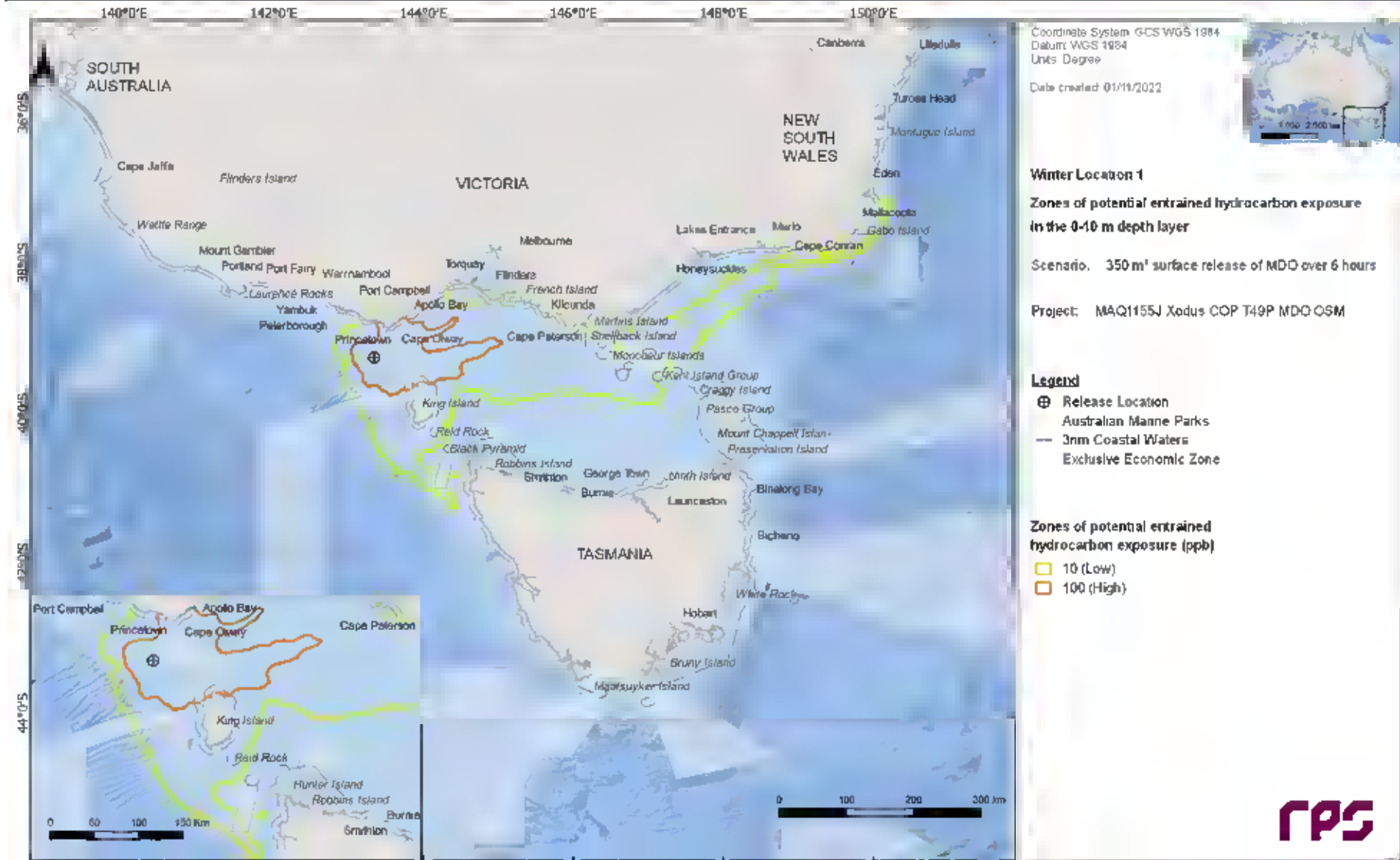


Figure 12.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

12.3 Deterministic Analysis

12.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of oil ashore was identified as run number 94 and commenced during winter conditions, 6 pm 31st August 2013.

Figure 13.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 15.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 30 days are presented in Figure 13.11 and Figure 13.12, respectively.

Figure 13.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 191 m³ (~55%) was lost to the atmosphere through evaporation. Approximately, 100 m³ (~29%) of the released volume decayed, while approximately 60 m³ (~17%) was predicted to remain within the water column and approximately 3 m³ (~1%) was present on the shorelines.

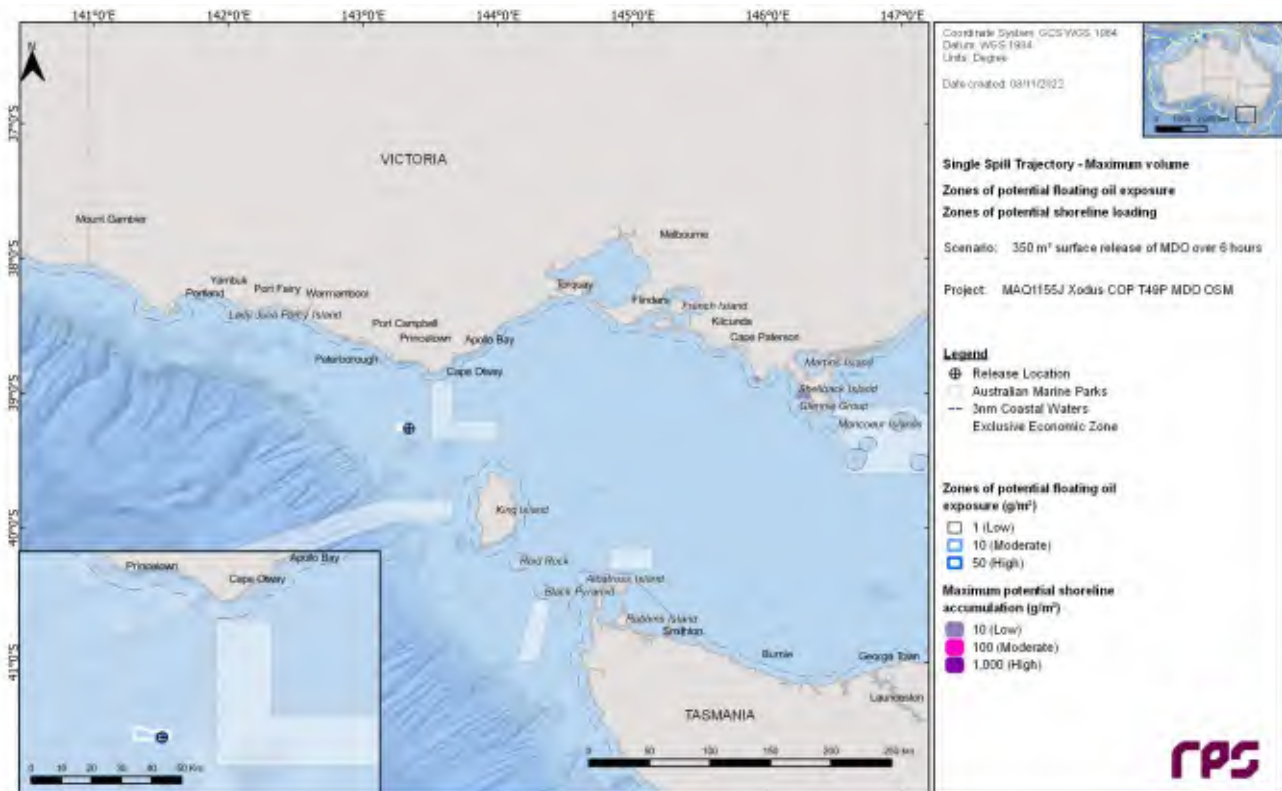


Figure 12.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

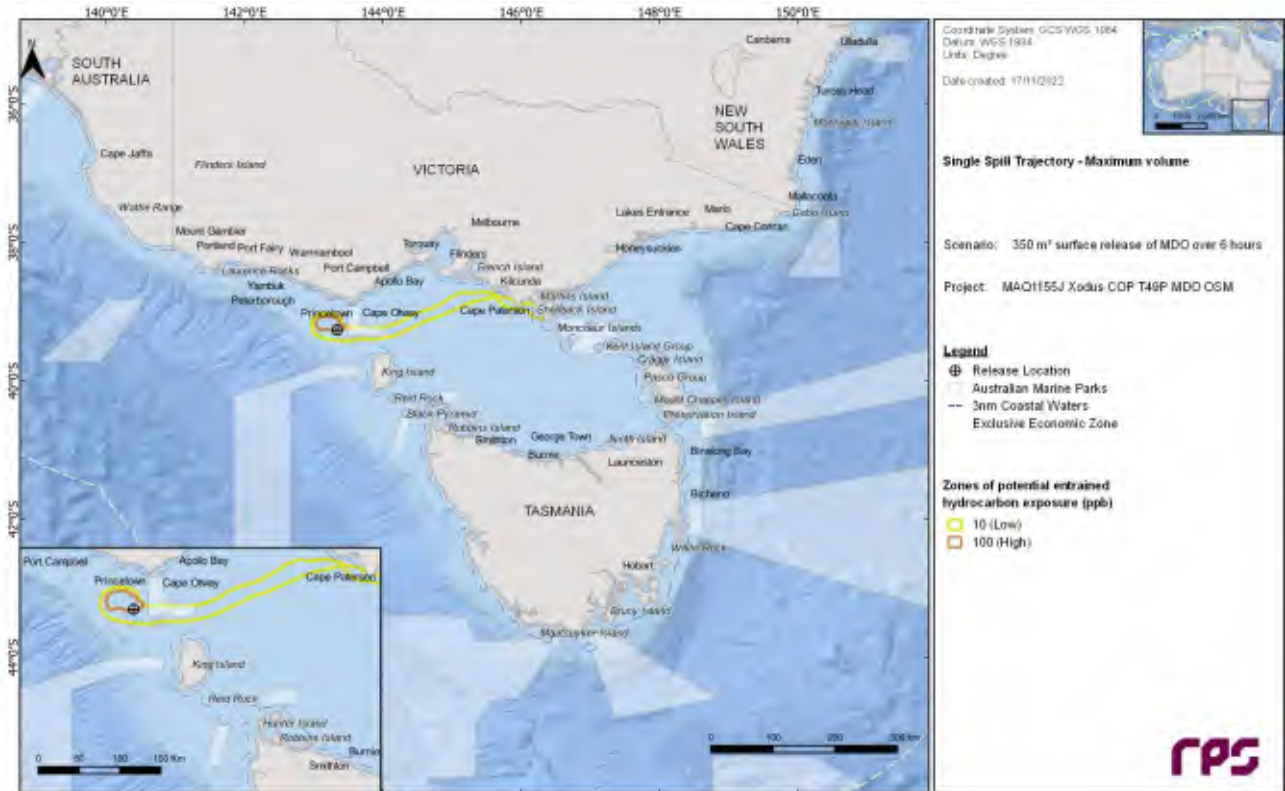


Figure 12.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

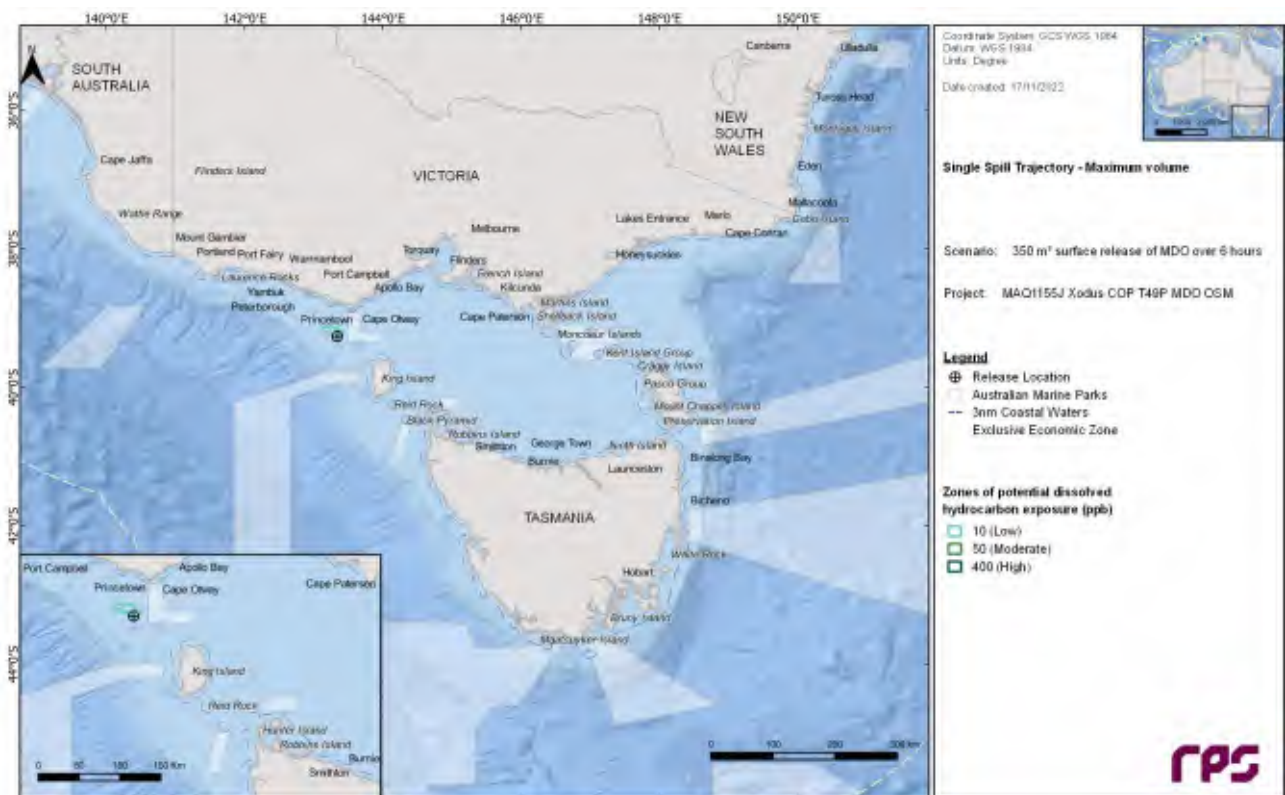


Figure 12.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

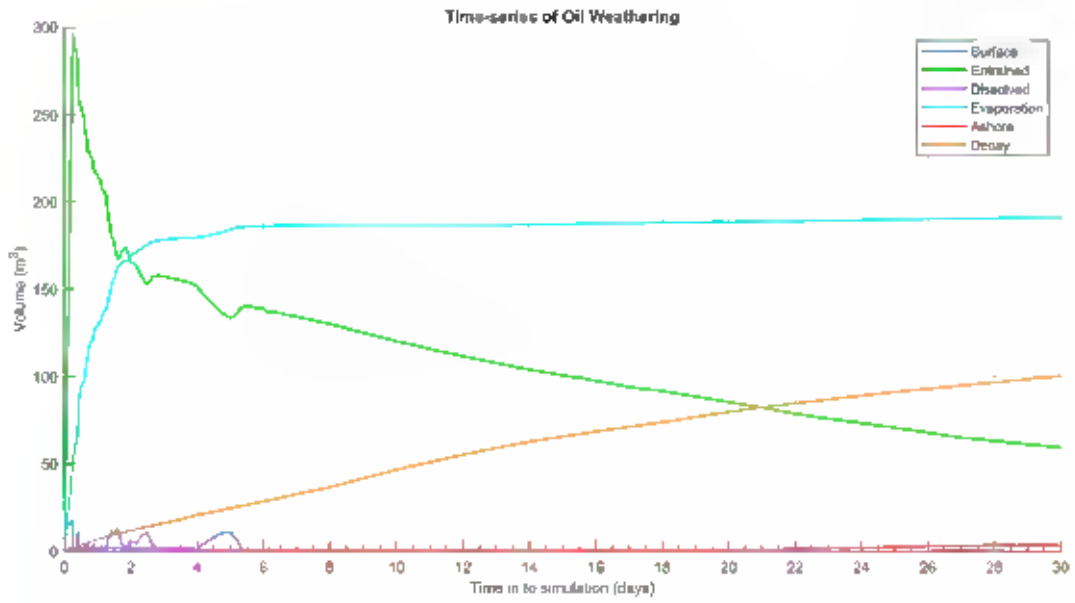


Figure 12.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

13 LOCATION 2 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 2. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 30 days.

Section 13.1 presents the EMBA, Section 13.2 shows the seasonal (or stochastic) results, while Section 13.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

13.1 EMBA

Figure 13.1 shows the EMBA for Location 2. The EMBA encompasses the outer extent of all 200 l spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

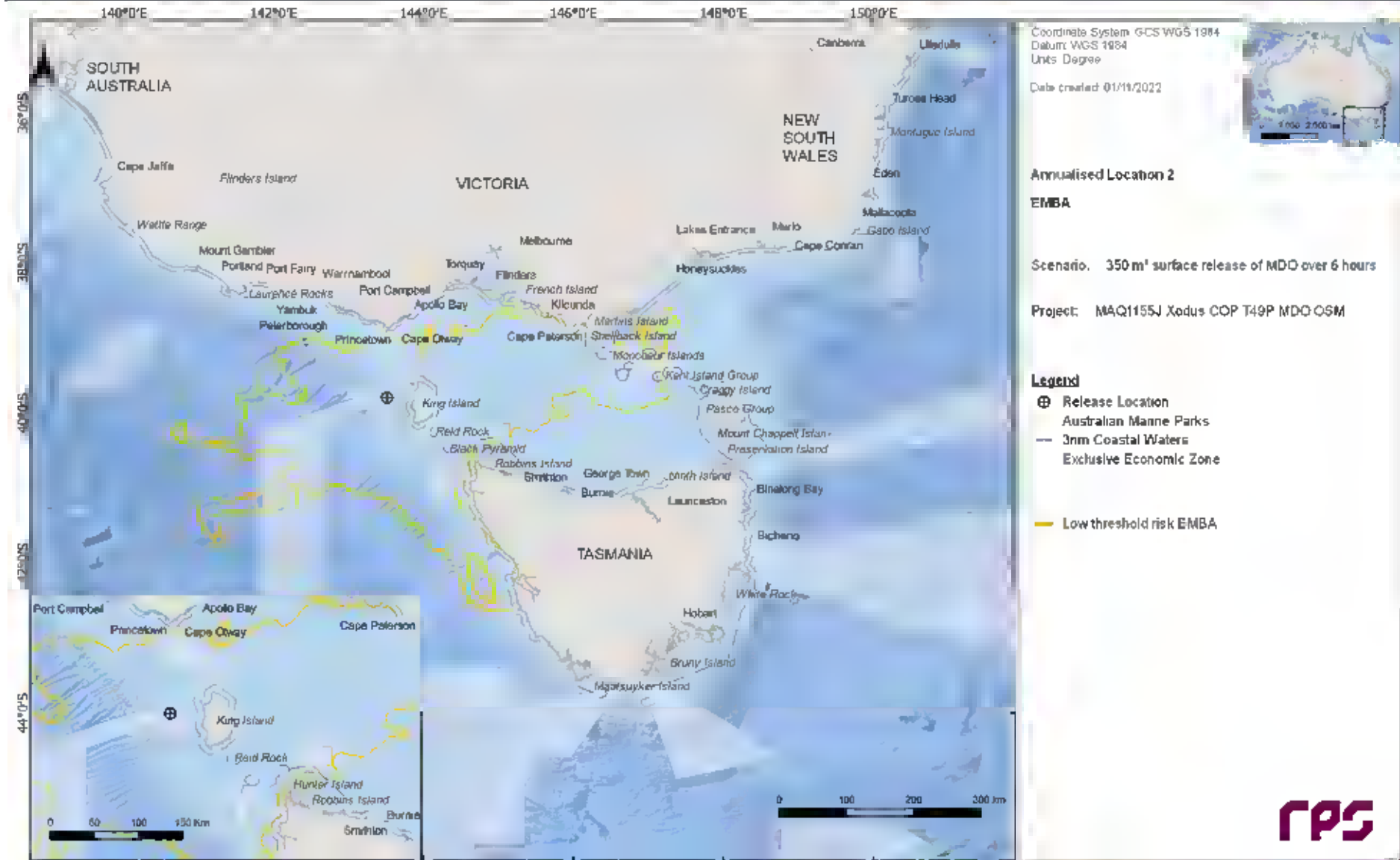


Figure 13.1 Predicted low threshold EMBA from a vessel collision at Location 2. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

13.2 Stochastic Analysis

13.2.1 Floating Oil Exposure

Table 13.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 13.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 13.2 to Figure 13.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 154.1 km² and 116.7 km², respectively.

Table 13.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	37.8	19.2	5.2
	Maximum distance (km) from release location (99 th percentile)	23	17.9	5.2
	Direction	NE	S	SSW
Winter	Maximum distance (km) from release location	42.7	15.6	3.2
	Maximum distance (km) from release location (99 th percentile)	22.3	15.2	3.2
	Direction	SE	ESE	ESE

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Table 13.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 2 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
AMP	Zeehan	100	100	16	0.04	0.04	0.04	100	100	17	0.04	0.04	0.04
IBRA	King Island	-	-	-	-	-	-	3	-	-	2.58	-	-
IMCRA	Otway	100	100	16	0.04	0.04	0.04	100	100	17	0.04	0.04	0.04
Near Shore Waters	King Island	-	-	-	-	-	-	3	-	-	2.58	-	-
State Waters	Tasmania	-	-	-	-	-	-	5	-	-	1.79	-	-

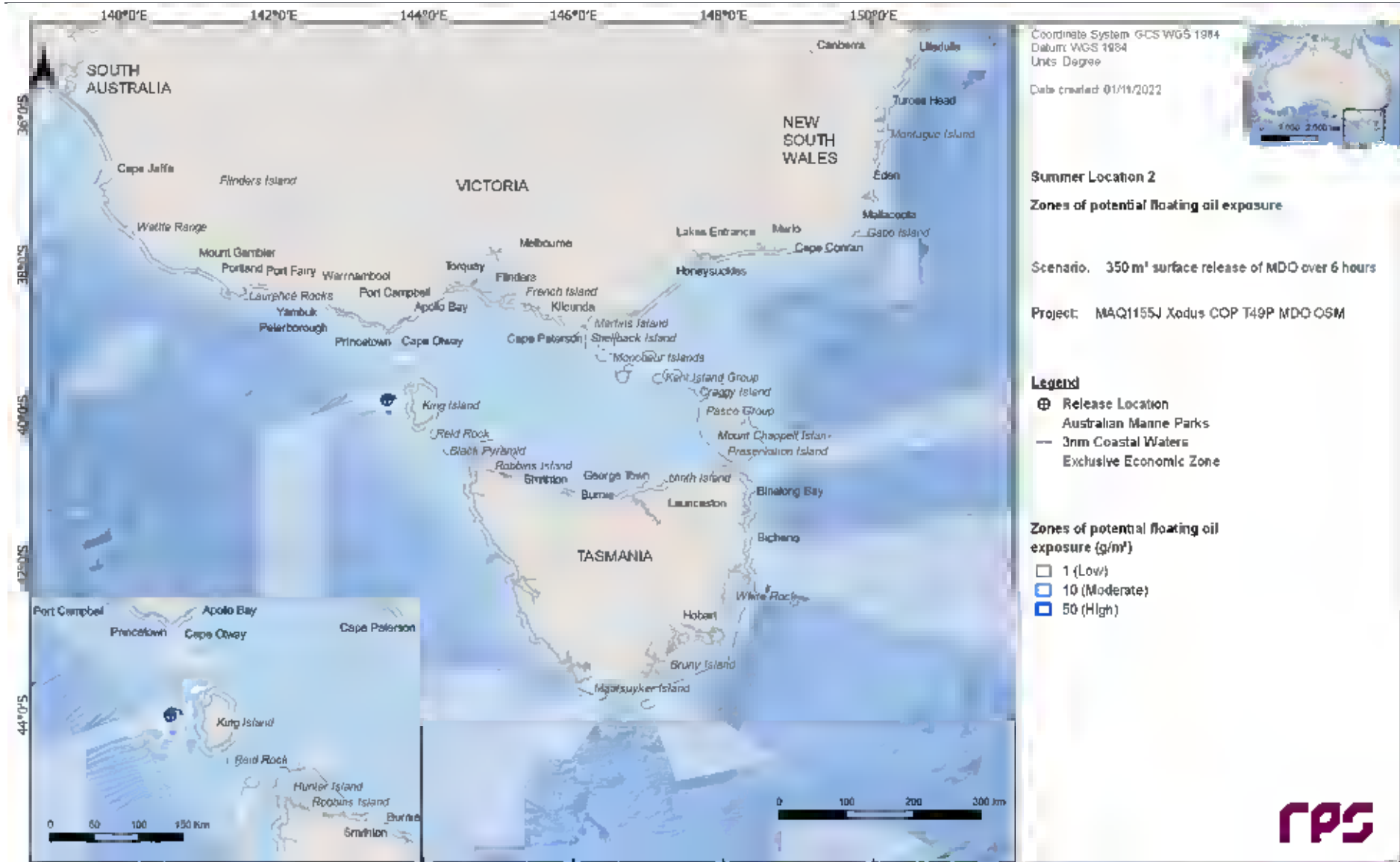


Figure 13.2 Zones of potential floating oil exposure from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

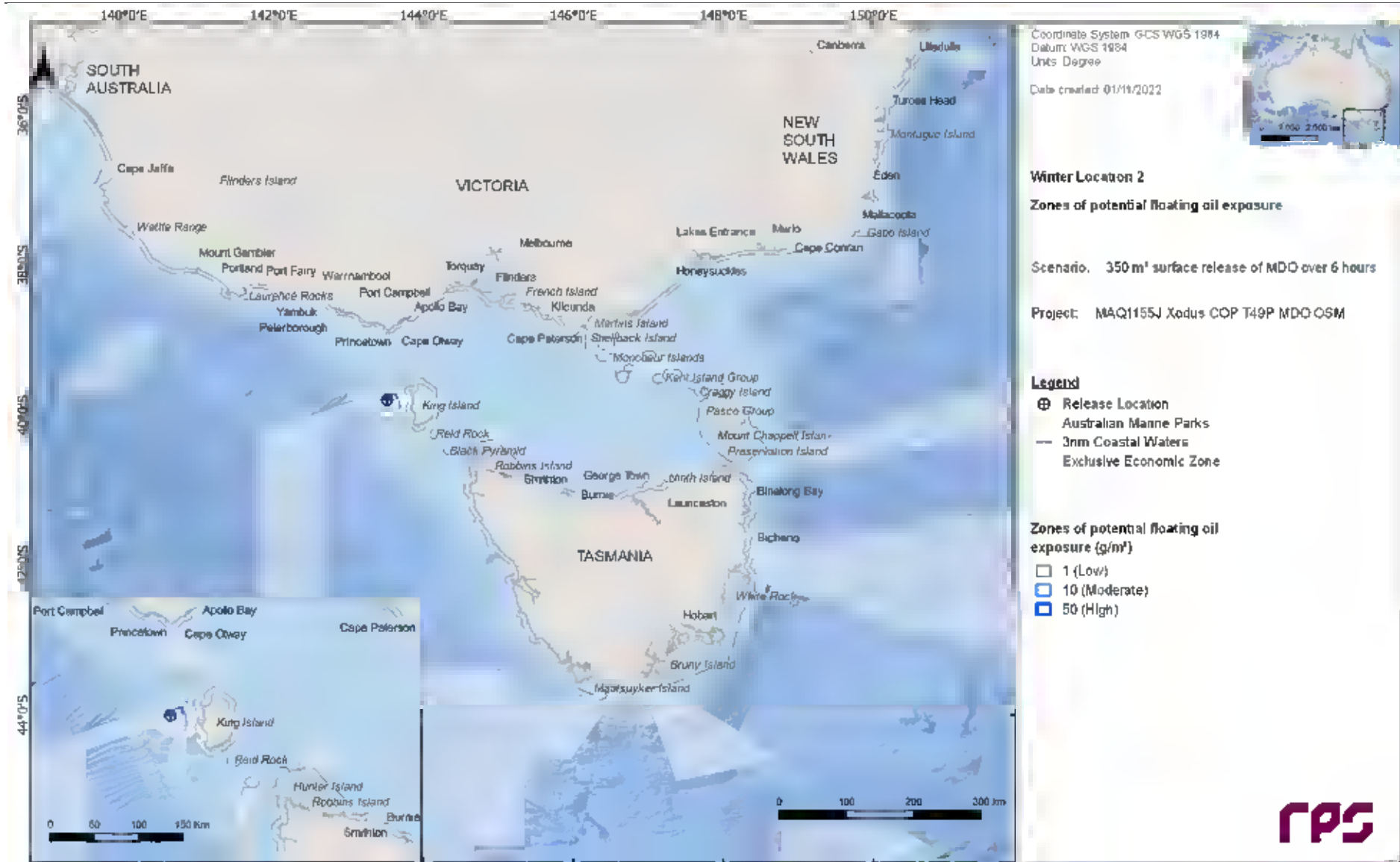


Figure 13.3 Zones of potential floating oil exposure from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

13.2.2 Shoreline Accumulation

Table 13.3 Table 12.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 13.4 to Table 13.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 13.4 and Figure 13.5.

Table 13.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 2 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	35	68
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	2.33	1.50
Maximum volume of hydrocarbons ashore (m ³)	35.2	47.4
Average volume of hydrocarbons ashore (m ³)	5.1	8.3
Maximum length of the shoreline at 10 g/m² (km)	27	35
Average shoreline length (km) at 10 g/m² (km)	9.2	11.9
Maximum length of the shoreline at 100 g/m² (km)	11	14
Average shoreline length (km) at 100 g/m² (km)	3.5	4.1
Maximum length of the shoreline at 1,000 g/m² (km)	-	2
Average shoreline length (km) at 1,000 g/m² (km)	-	2

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Table 13.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 2 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Black Pyramid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glennie Group	1	-	-	11.38	-	-	54	54	2.6	2.6	5.7	-	-	5.7	-	-
Hunter Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kanowna Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
King Island	33	10	-	2.33	2.67	-	34	451	5	35.2	9	3.3	-	25.8	10.5	-
Moncoeur Islands	1	-	-	15.79	-	-	14	14	0.3	0.3	1.9	-	-	1.9	-	-
Reid Rock	1	-	-	8.75	-	-	19	19	0.4	0.4	2.9	-	-	2.9	-	-
Rodondo Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skull Rock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Gippsland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Table 13.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 2 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	1	1	-	8.71	9.29	-	148	148	2.9	2.9	1.9	1.9	-	1.9	1.9	-
Black Pyramid	1	-	-	12.25	-	-	10	10	< 0.1	< 0.1	1	-	-	1	-	-
Glennie Group	1	-	-	9.79	-	-	27	27	0.6	0.6	1.9	-	-	1.9	-	-
Hunter Island	1	-	-	23.92	-	-	13	13	0.8	0.8	1	-	-	1	-	-
Kanowna Island	1	1	-	7.38	10.25	-	119	119	3.4	3.4	3.8	1.9	-	3.8	1.9	-
King Island	62	26	1	1.5	1.96	5.54	55	1,959	8	47.4	12.1	4	1.9	33.5	13.4	1.9
Moncoeur Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reid Rock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rodondo Island	1	-	-	14.58	-	-	12	12	0.1	0.1	1	-	-	1	-	-
Skull Rock	1	1	-	7.38	10.25	-	119	119	2.2	2.2	2.9	1	-	2.9	1	-
South Gippsland	2	-	-	8.79	-	-	27	99	< 0.1	3.6	6.2	-	-	9.6	-	-
West Coast	1	-	-	18.67	-	-	14	14	1.5	1.5	3.8	-	-	3.8	-	-

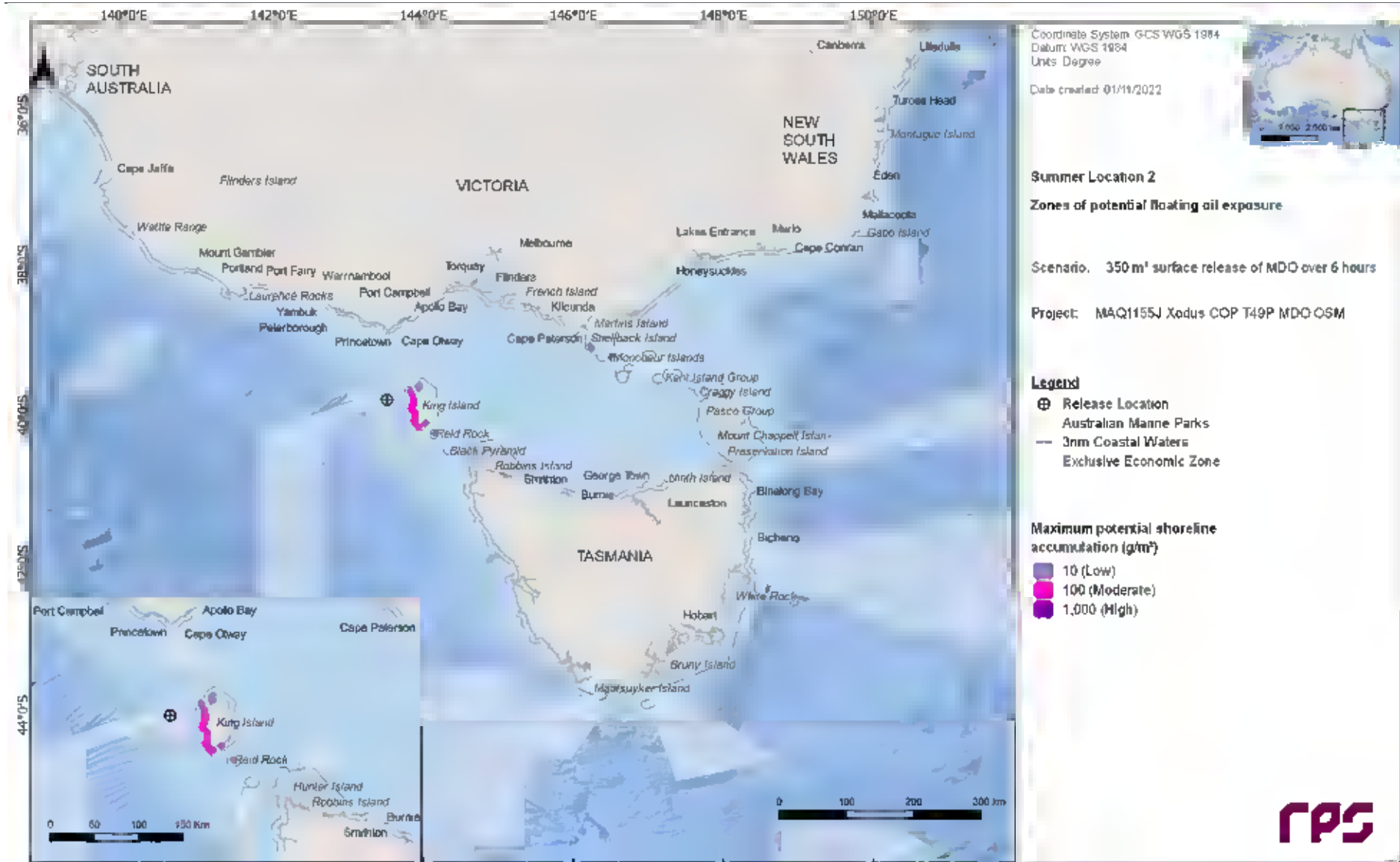


Figure 13.4 Maximum potential shoreline loading from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

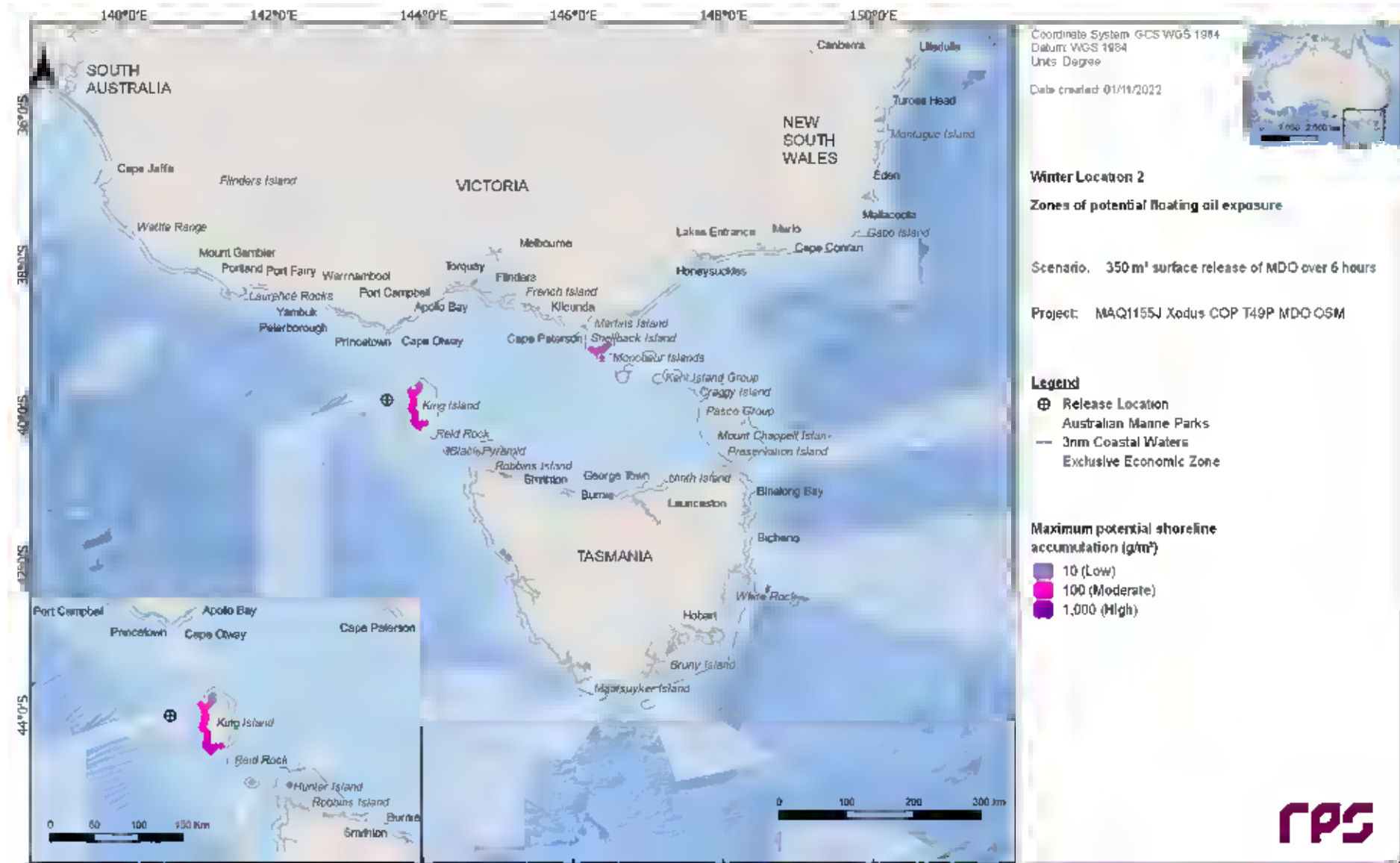


Figure 13.5 Maximum potential shoreline loading from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

13.2.3 In-water exposure

13.2.3.1 Dissolved Hydrocarbons

Table 13.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 13.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 13.6 and Figure 13.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 13.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	69	13	-
	Maximum distance (km) from release location (99 th percentile)	54	13	-
	Direction	S	ESE	-
Winter	Maximum distance (km) from release location	89	3	-
	Maximum distance (km) from release location (99 th percentile)	69	3	-
	Direction	ENE	ENE	-

Table 13.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer				Winter			
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High
AMP	Zeehan	124	59	10	-	100	60	11	-
IBRA	King Island	13	1	-	-	18	4	-	-
IMCRA	Central Bass Strait	5	-	-	-	13	1	-	-
	Otway	124	59	10	-	100	60	11	-
KEF	West Tasmania Canyons	18	1	-	-	2	-	-	-
Near Shore Waters	King Island	13	1	-	-	18	4	-	-
State Waters	Tasmania	33	2	-	-	28	4	-	-

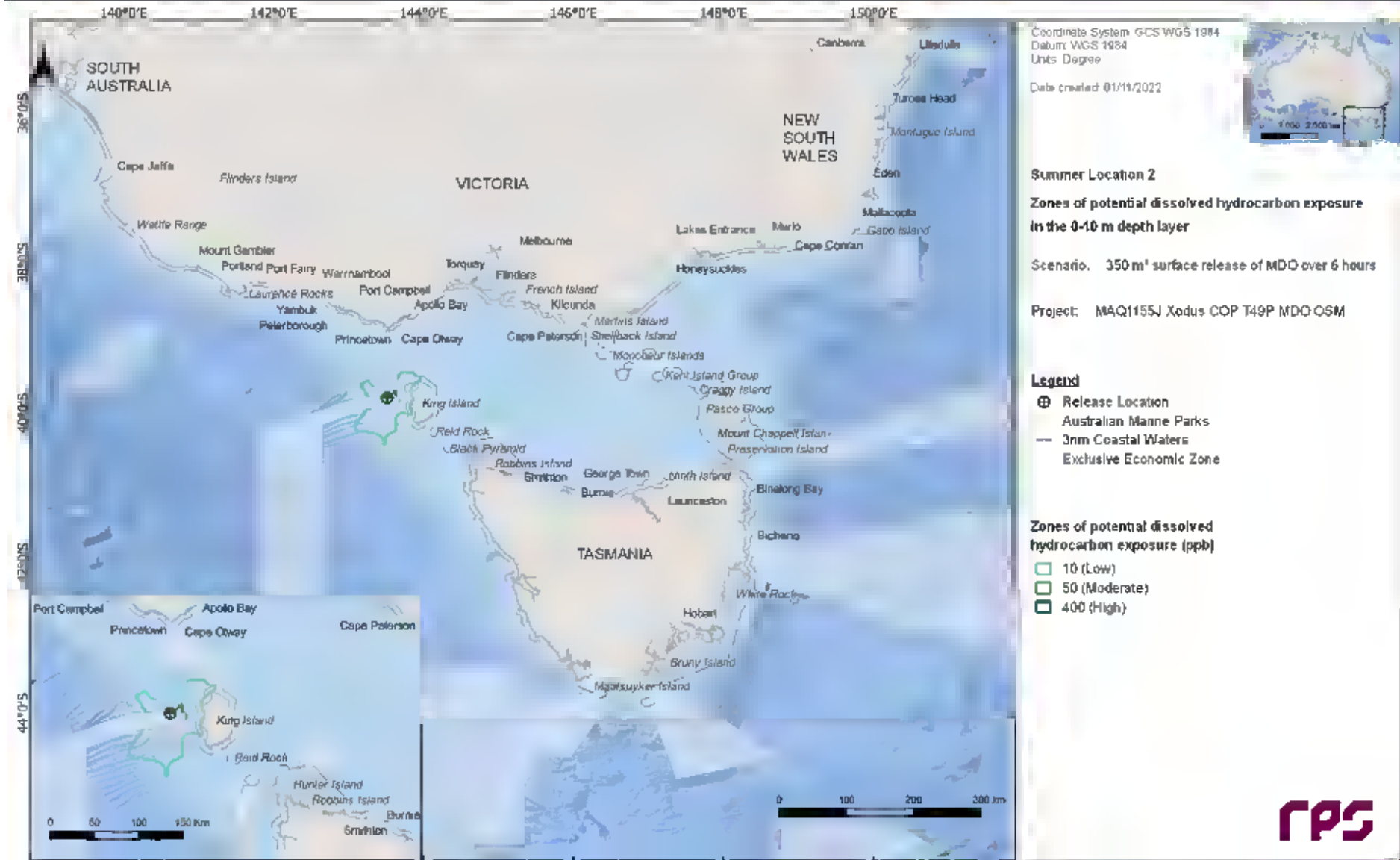


Figure 13.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

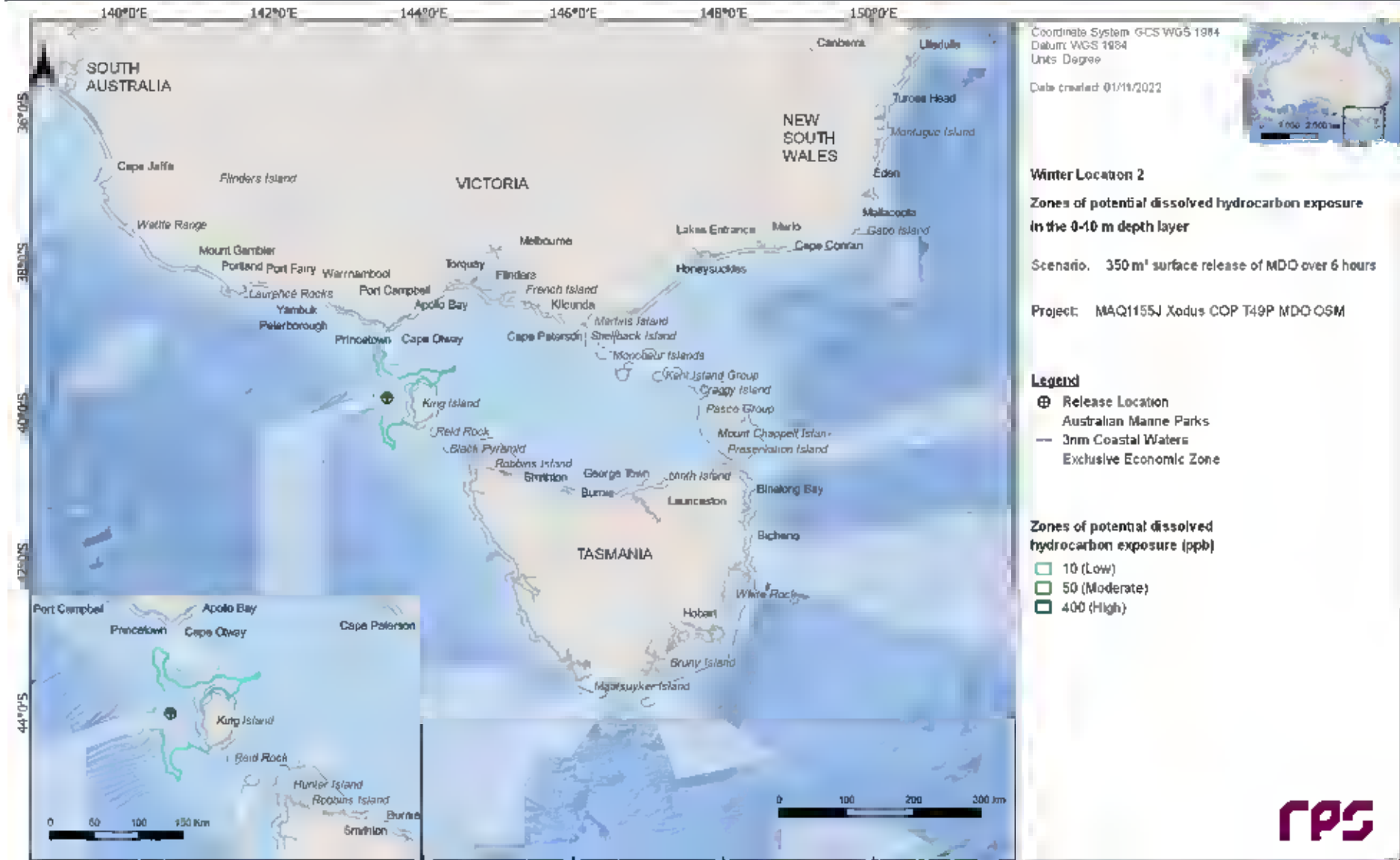


Figure 13.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

13.2.3.2 Entrained Hydrocarbons

Table 13.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 13.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 13.8 and Figure 13.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 13.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	352	86
	Maximum distance (km) from release location (99 th percentile)	319	80
	Direction	ENE	S
Winter	Maximum distance (km) from release location	356	150
	Maximum distance (km) from release location (99 th percentile)	321	117
	Direction	ENE	ENE

Table 13.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer			Winter		
		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
			Low	High		Low	High
AMP	Apollo	62	9	-	249	8	1
	Beagle	22	1	-	31	4	-
	Boags	15	2	-	20	2	-
	Franklin	25	6	-	45	4	-
	Zeehan	9,750	98	92	7,673	96	92
IBRA	Flinders	3	-	-	18	3	-
	Gippsland Plain	6	-	-	15	1	-
	King Island	385	31	9	716	47	20
	Strzelecki Ranges	5	-	-	13	1	-
	Tasmanian West	11	1	-	17	2	-
	Wilson's Promontory	38	2	-	71	5	-
IMCRA	Boags	11	2	-	18	2	-
	Central Bass Strait	330	12	2	476	23	6
	Central Victoria	35	1	-	51	3	-
	Flinders	42	2	-	71	6	-
	Franklin	21	4	-	45	4	-
	Otway	9,750	98	92	7,673	96	92
KEF	Two-fold Shelf	14	1	-	18	3	-
	West Tasmania Canyons	476	24	5	212	5	2
MNP	Wilson's Promontory	32	2	-	71	4	-
NPS4	Wilson's Promontory Marine Reserve	37	1	-	20	3	-
Ramsar	Lavinia	19	1	-	27	2	-
RSB	Bell Reef	47	7	-	35	10	-
	Cody Bank	8	-	-	11	1	-
Nearshore Waters	Cutter Rock	6	-	-	19	2	-
	Albatross Island	12	1	-	14	2	-
	Anser Island	13	1	-	71	2	-
	Black Pyramid	21	3	-	30	4	-
	Curtis Island	3	-	-	13	3	-
	Glennie Group	38	2	-	41	3	-
	Hogan Island Group	3	-	-	18	2	-
	Hunter Island	9	-	-	12	1	-
	Kanowna Island	16	1	-	71	4	-
	King Island	386	31	9	716	47	20
	Moncoeur Islands	26	1	-	16	3	-
Norman Island	20	1	-	9	-	-	
Reid Rock	62	8	-	125	12	1	

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	Rodondo Island	26	1	-	21	4	-
	Skull Rock	16	1	-	70	5	-
	South Gippsland	9	-	-	56	2	-
	West Coast	11	1	-	17	2	-
State Waters	Tasmania	621	40	15	786	49	25
	Victoria	42	2	-	71	6	-

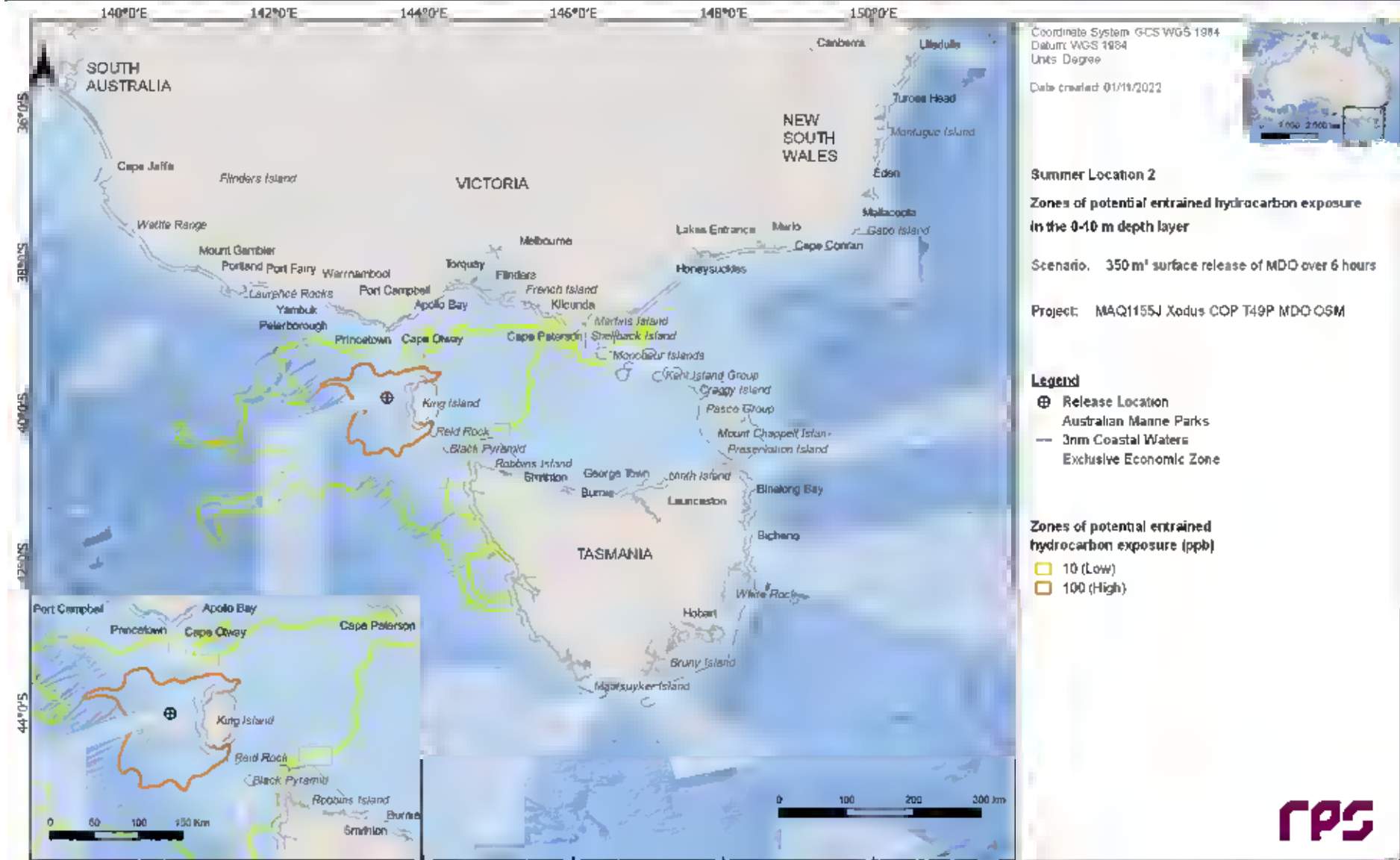


Figure 13.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

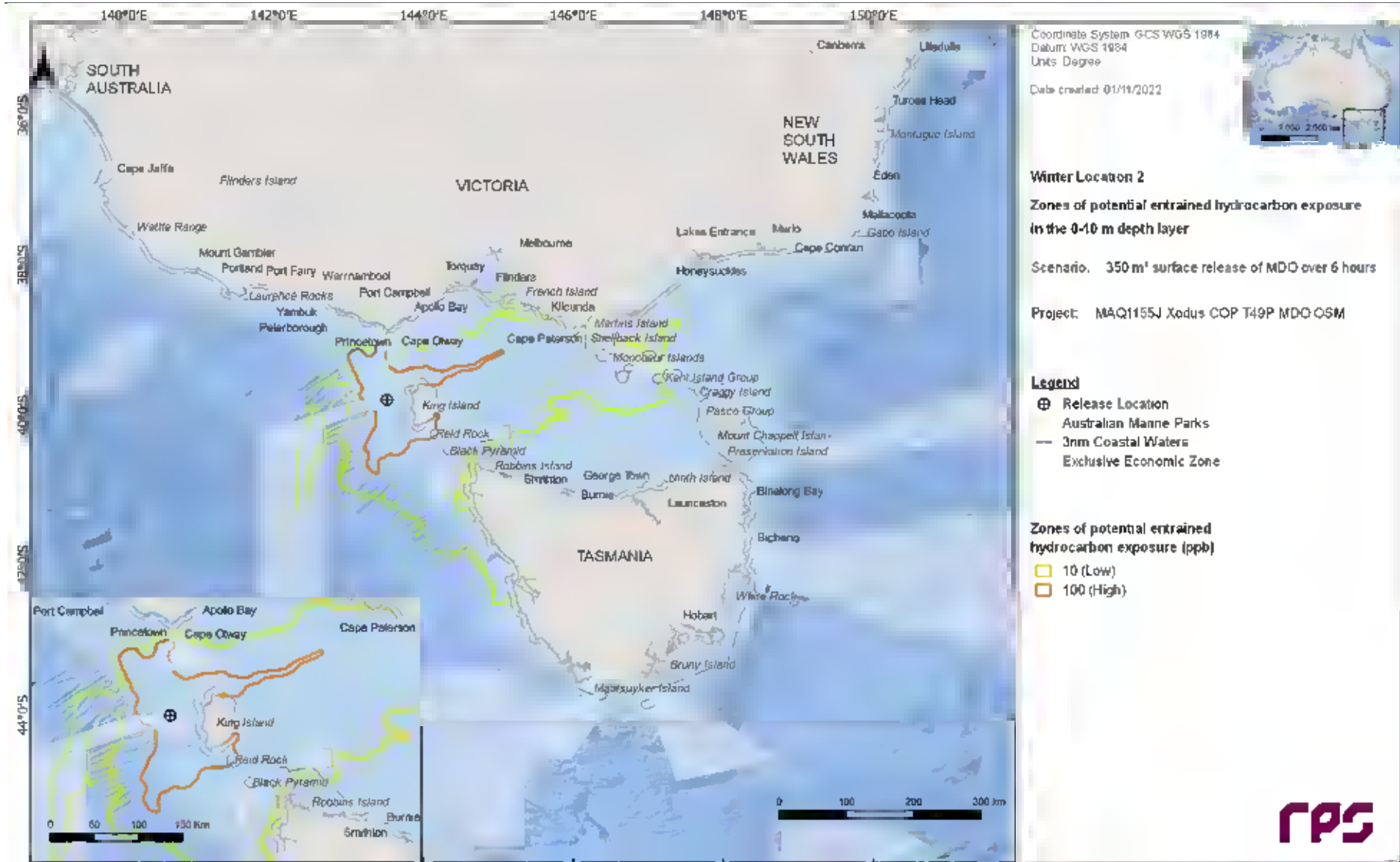


Figure 13.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

13.3 Deterministic Analysis

13.3.1 Largest Volume of Hydrocarbons Ashore & Minimum time to Shoreline Accumulation

The simulation that resulted in the largest volume of hydrocarbons ashore of 47.4 m³ and minimum time to hydrocarbons ashore of 1.50 days was identified as run number 15 and commenced during winter conditions, 2 am 5th September 2012.

Figure 13.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred 1 day and 6 hours into the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 30 days are presented in Figure 13.11 and Figure 13.12, respectively.

Figure 13.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 178 m³ (~51%) was lost to the atmosphere through evaporation. Approximately, 88 m³ (~25%) of the released volume decayed, while approximately 43 m³ (~12%) was predicted to remain within the water column and approximately 44 m³ (~12.5%) was present on the shorelines.

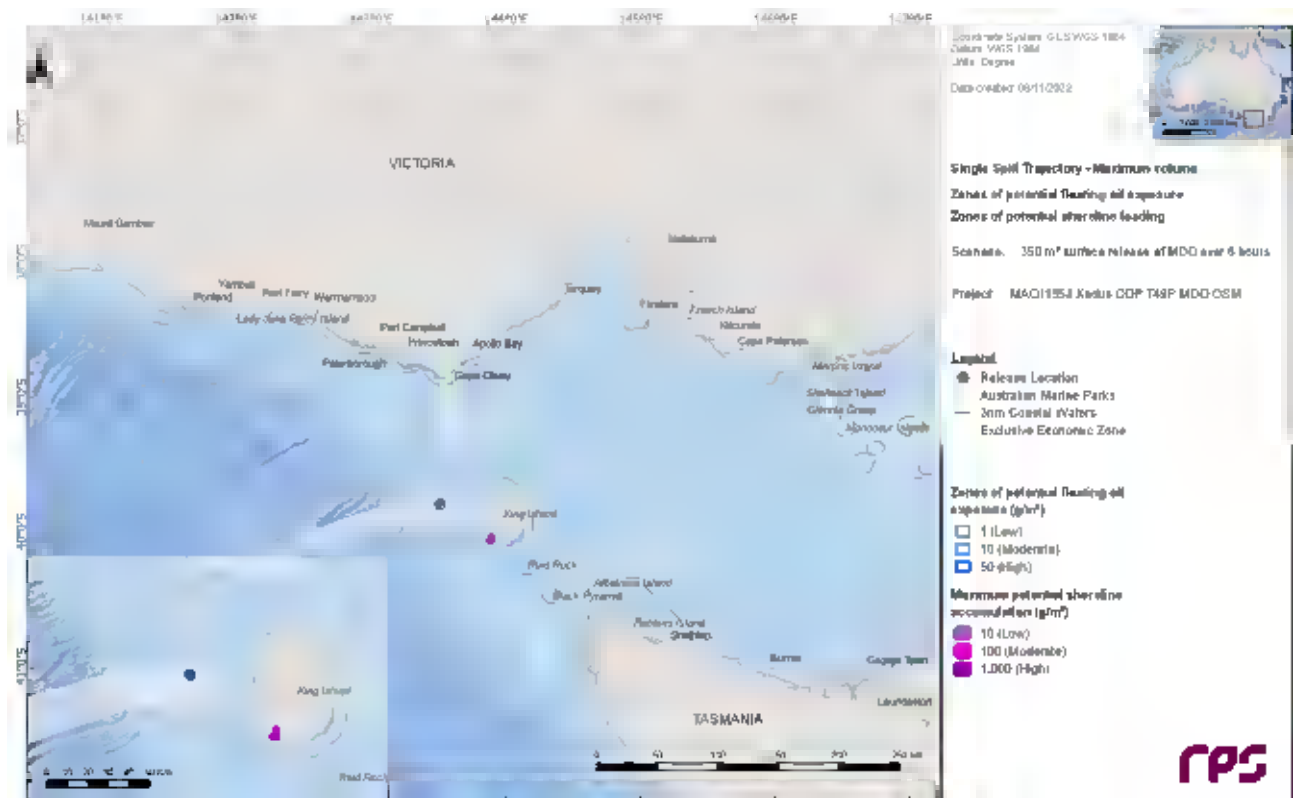


Figure 13.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

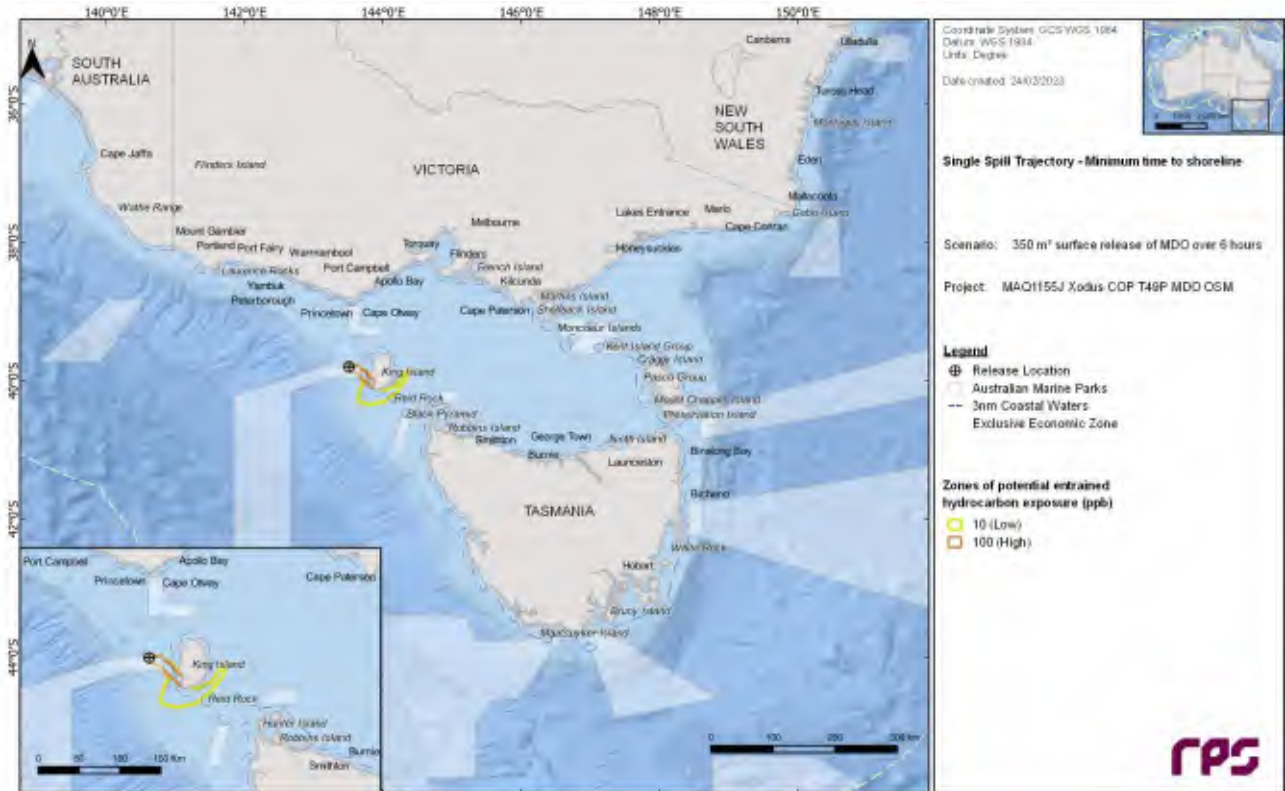


Figure 13.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

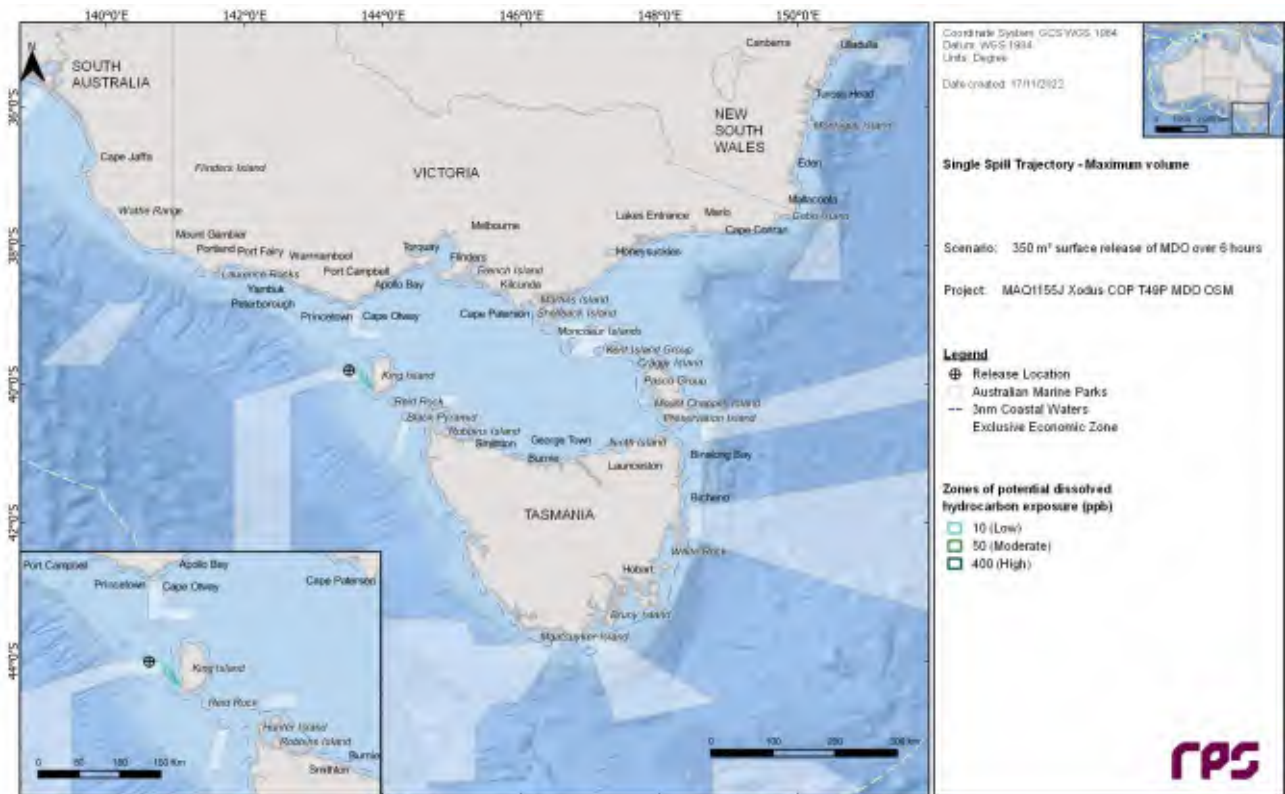


Figure 13.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

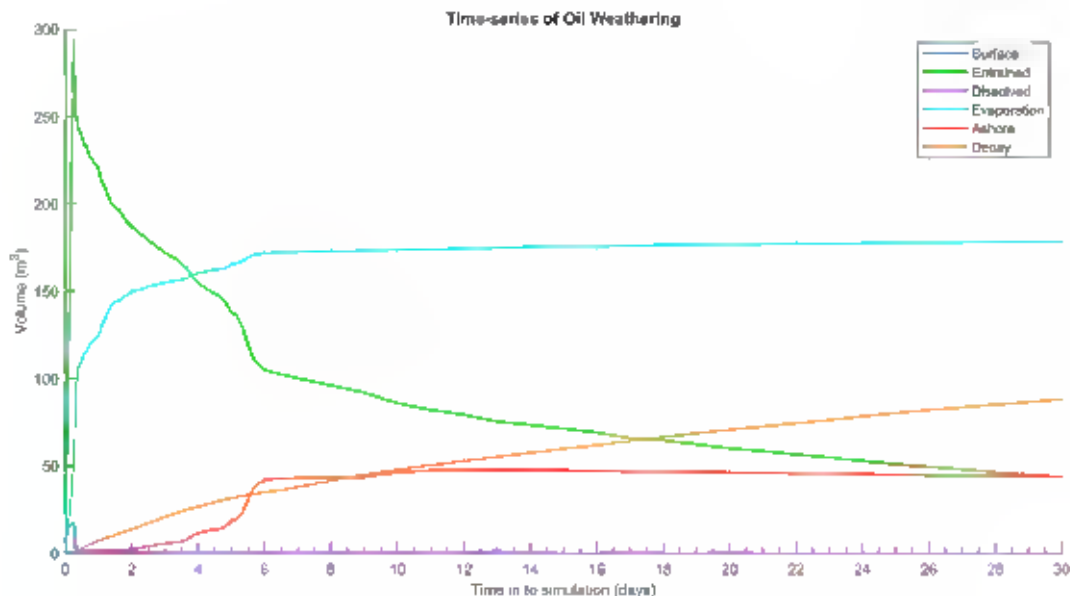


Figure 13.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

13.3.2 Longest Length of Shoreline Accumulation

The simulation that resulted in the longest length of hydrocarbons ashore of 35.2 km was identified as run number 95 which commenced during winter conditions, 7 am 16th July 2010.

Figure 13.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 3 of the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 13.15 and Figure 13.16, respectively.

Figure 13.17 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 180 m³ (~51%) was lost to the atmosphere through evaporation. Approximately, 95 m³ (~28%) of the released volume decayed, while approximately 70 m³ (~19%) was predicted to remain within the water column and approximately 10 m³ (3%) remained on shorelines.

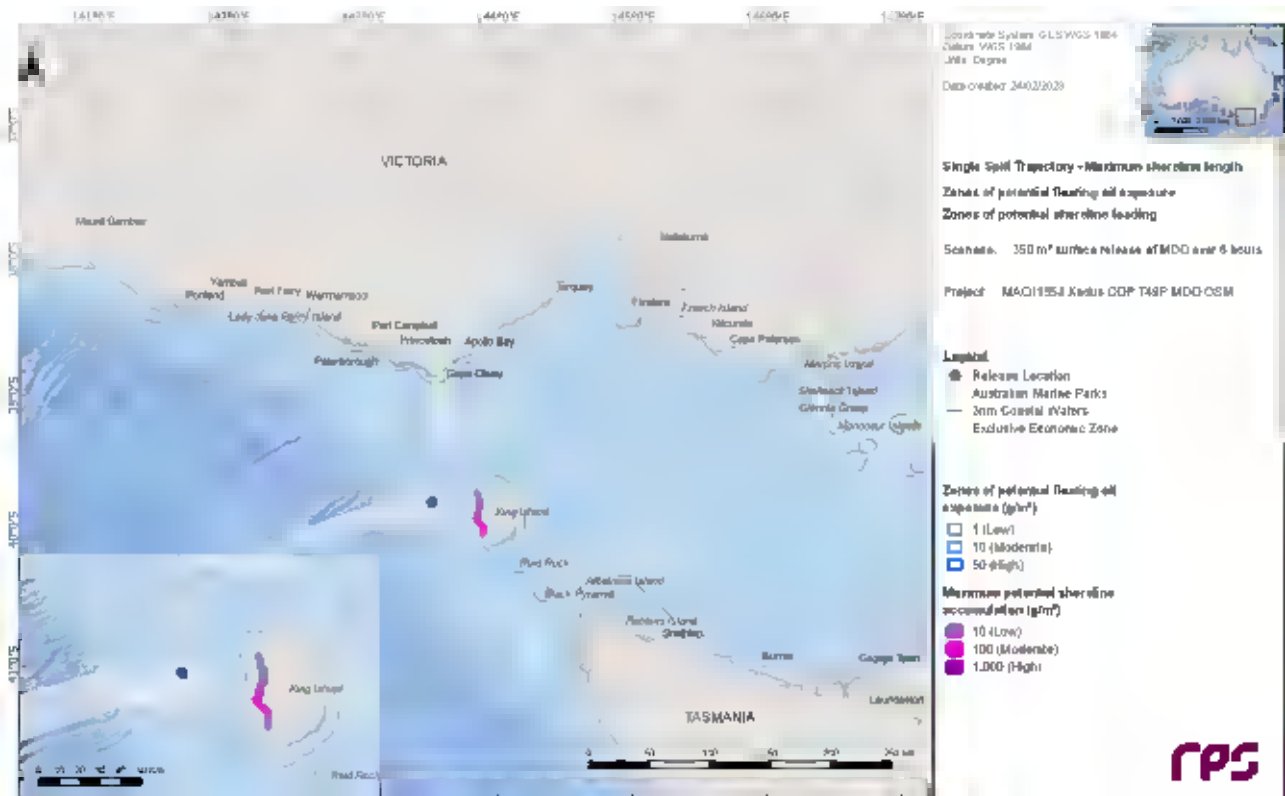


Figure 13.14 Predicted extent of the floating hydrocarbon exposure and shoreline loading over the entire 30 days for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

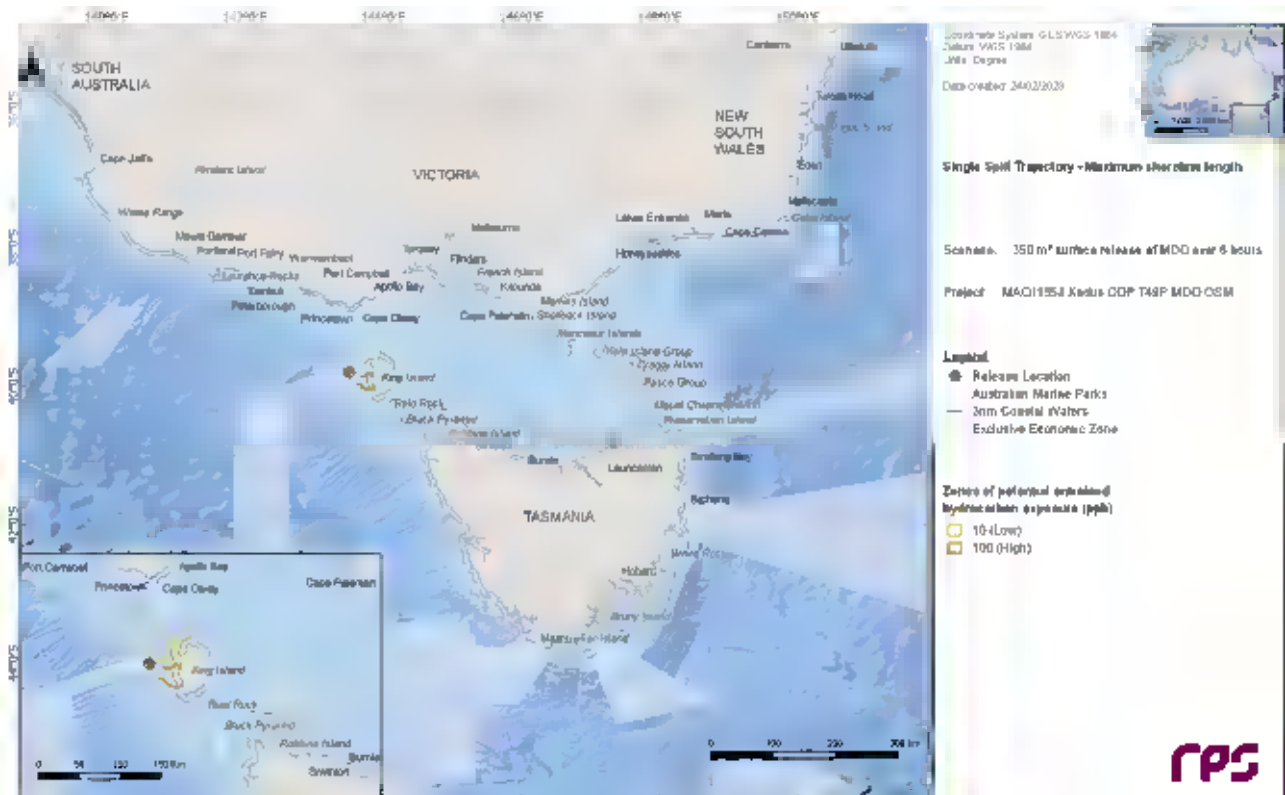


Figure 13.15 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

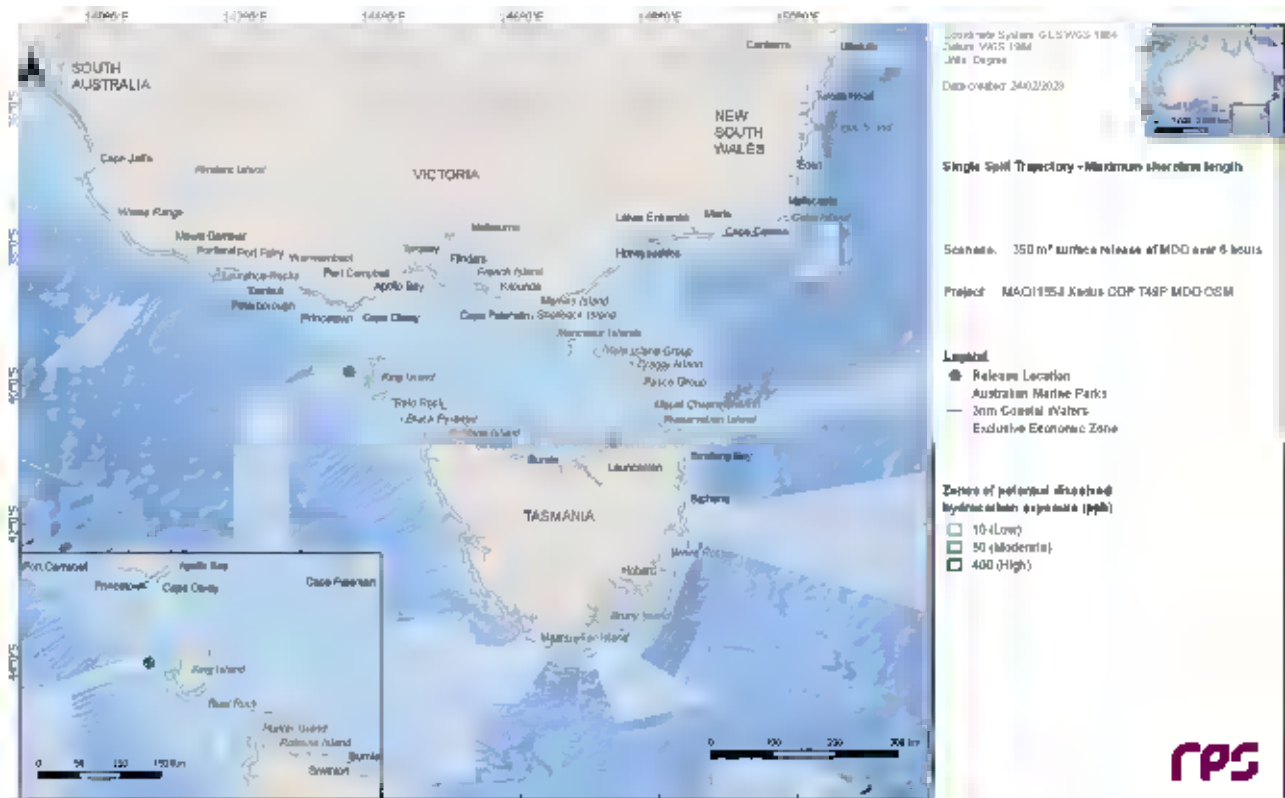


Figure 13.16 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

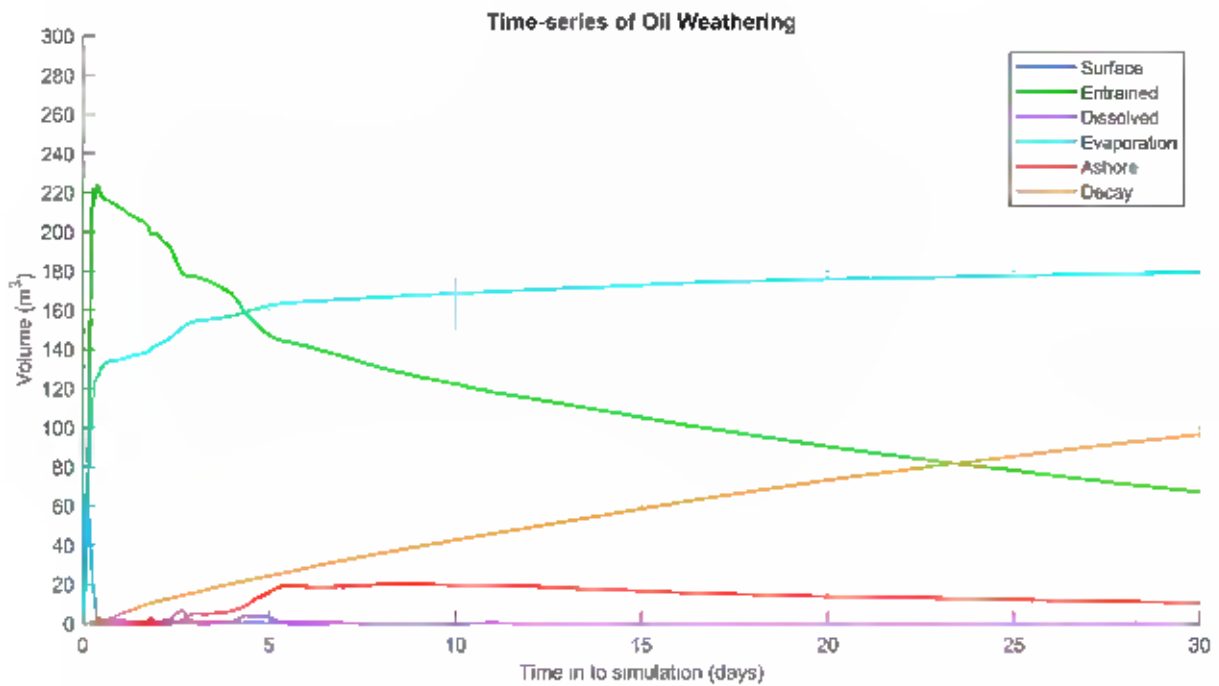


Figure 13.17 Predicted weathering and fates for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

14 LOCATION 3 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 3. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 30 days.

Section 14.1 presents the low threshold EMBA, Section 14.2 shows the seasonal (or stochastic) analysis results, while Section 14.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

14.1 EMBA

Figure 14.1 shows the EMBA for Location 3. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

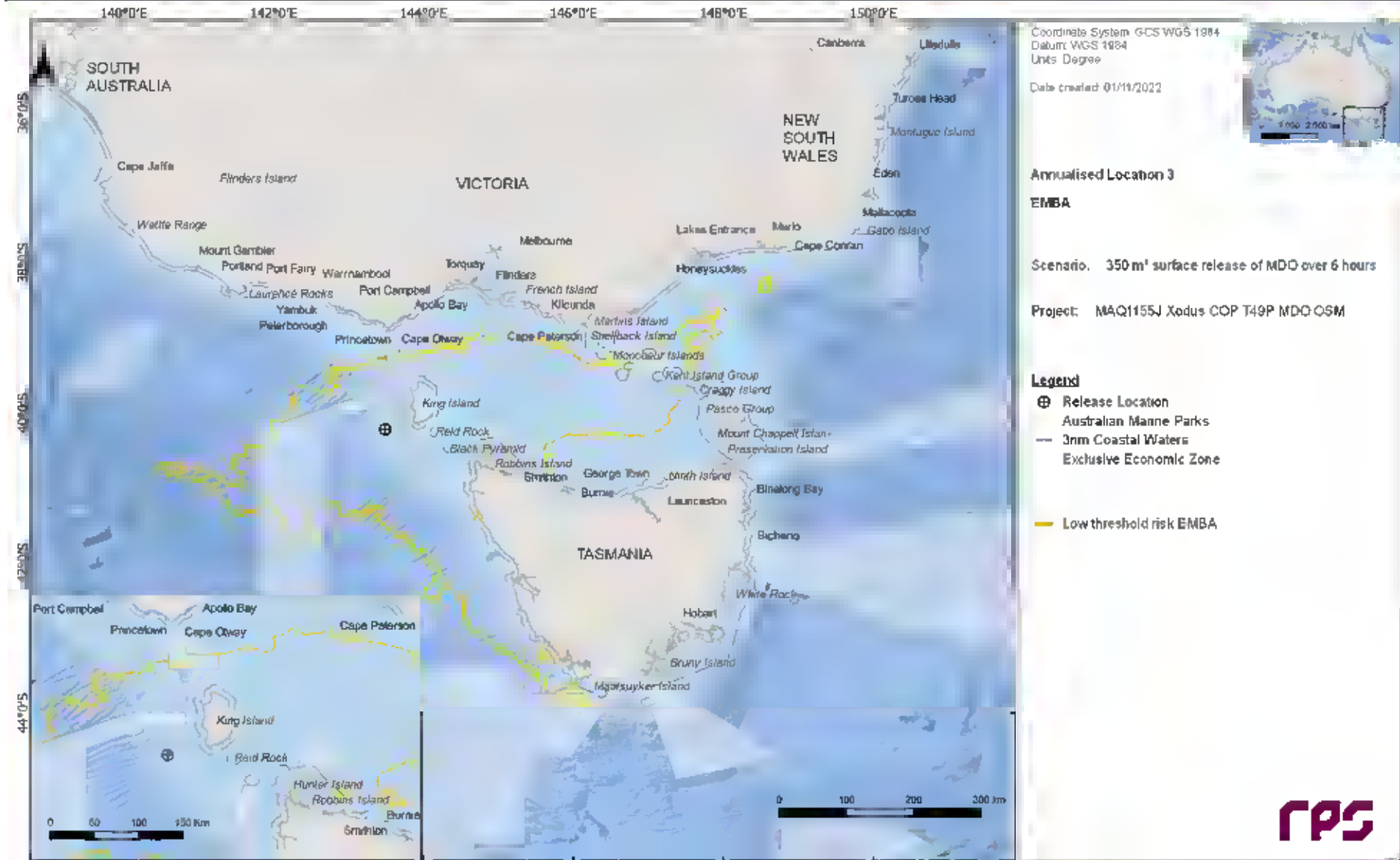


Figure 14.1 Predicted low threshold EMBA from a vessel collision at Location 3. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

14.2 Stochastic Analysis

14.2.1 Floating Oil Exposure

Table 14.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 14.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 14.2 to Figure 14.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 170.6 km² and 158.7 km², respectively.

Table 14.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	40.5	15.8	4.7
	Maximum distance (km) from release location (99 th percentile)	35	14.7	4.7
	Direction	SSE	SSE	N
Winter	Maximum distance (km) from release location	60.0	28.3	4.4
	Maximum distance (km) from release location (99 th percentile)	56.8	26.9	4.4
	Direction	SSE	S	SSE

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Table 14.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 3 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
IMCRA	Otway	100	100	24	0.04	0.04	0.04	100	100	14	0.04	0.04	0.04
KEF	Bonney Coast Upwelling	1	-	-	1.46	-	-	1	-	-	1.33	-	-

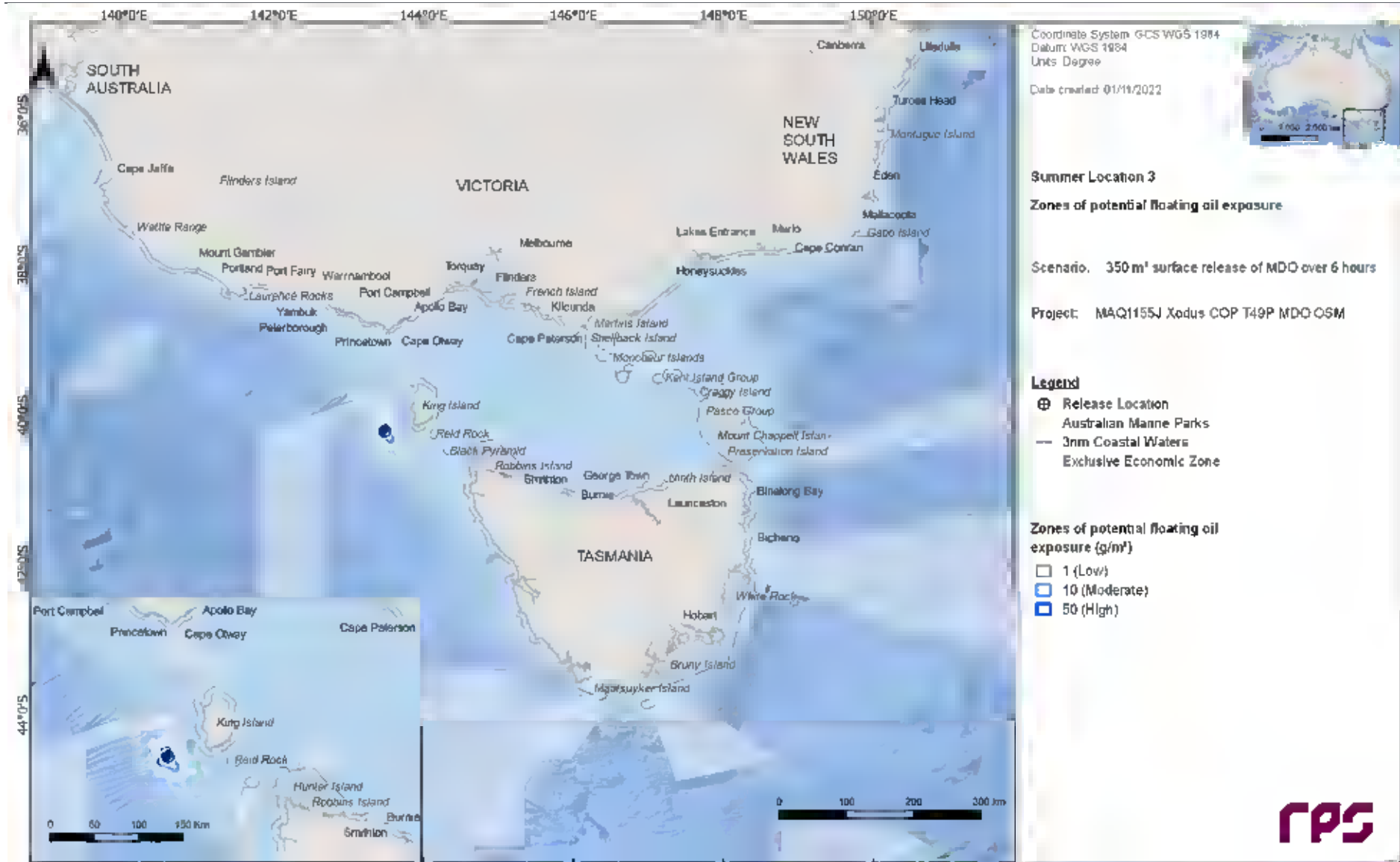


Figure 14.2 Zones of potential floating oil exposure from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

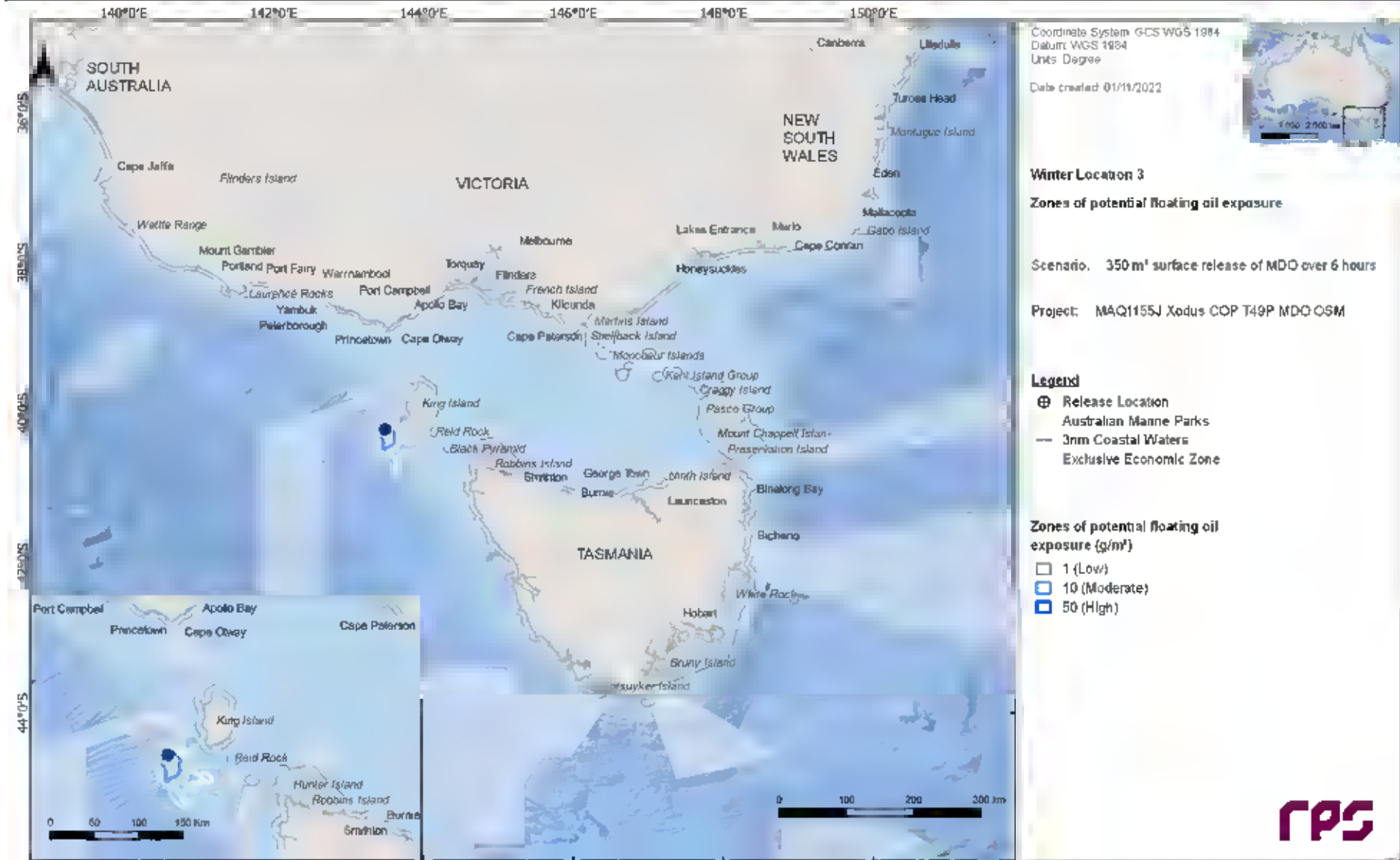


Figure 14.3 Zones of potential floating oil exposure from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

14.2.2 Shoreline Accumulation

Table 14.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 14.4 and Table 14.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 14.4 and Figure 14.5.

Table 14.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 3 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	26	33
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	2.96	2.29
Maximum volume of hydrocarbons ashore (m ³)	7.3	28.8
Average volume of hydrocarbons ashore (m ³)	2.1	3
Maximum length of the shoreline at 10 g/m² (km)	24	20
Average shoreline length (km) at 10 g/m² (km)	5.1	5.1
Maximum length of the shoreline at 100 g/m² (km)	2	9
Average shoreline length (km) at 100 g/m² (km)	1.3	5
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 14.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 3 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Black Pyramid	2	-	-	8.08	-	-	13	15	< 0.1	0.2	1	-	-	1	-	-
Circular Head	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hunter Island	3	-	-	13.63	-	-	14	22	< 0.1	1	1.6	-	-	2.9	-	-
Huon Valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kent Island Group	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
King Island	17	4	-	3.17	7.38	-	29	182	1.9	7.3	6.8	1.2	-	22.9	1.9	-
Reid Rock	3	-	-	2.96	-	-	16	26	< 0.1	0.4	1	-	-	1	-	-
West Coast	1	-	-	26.88	-	-	11	11	0.9	0.9	1	-	-	1	-	-

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Table 14.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 3 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Black Pyramid	3	-	-	8.67	-	-	18	25	< 0.1	0.3	1	-	-	1	-	-
Circular Head	7	-	-	9	-	-	17	47	0.3	2.5	2.6	-	-	4.8	-	-
Hunter Island	5	-	-	11.25	-	-	13	15	0.1	0.9	2.1	-	-	2.9	-	-
Huon Valley	1	-	-	22.04	-	-	14	14	0.6	0.6	1	-	-	1	-	-
Kent Island Group	1	-	-	18.25	-	-	19	19	0.6	0.6	1	-	-	1	-	-
King Island	14	3	-	2.29	4.96	-	38	557	2.2	28.8	6.6	4.8	-	19.1	8.6	-
Reid Rock	8	-	-	4.04	-	-	20	59	0.1	1.4	2.2	-	-	2.9	-	-
West Coast	2	-	-	9.88	-	-	23	72	0.2	3.3	8.6	-	-	8.6	-	-

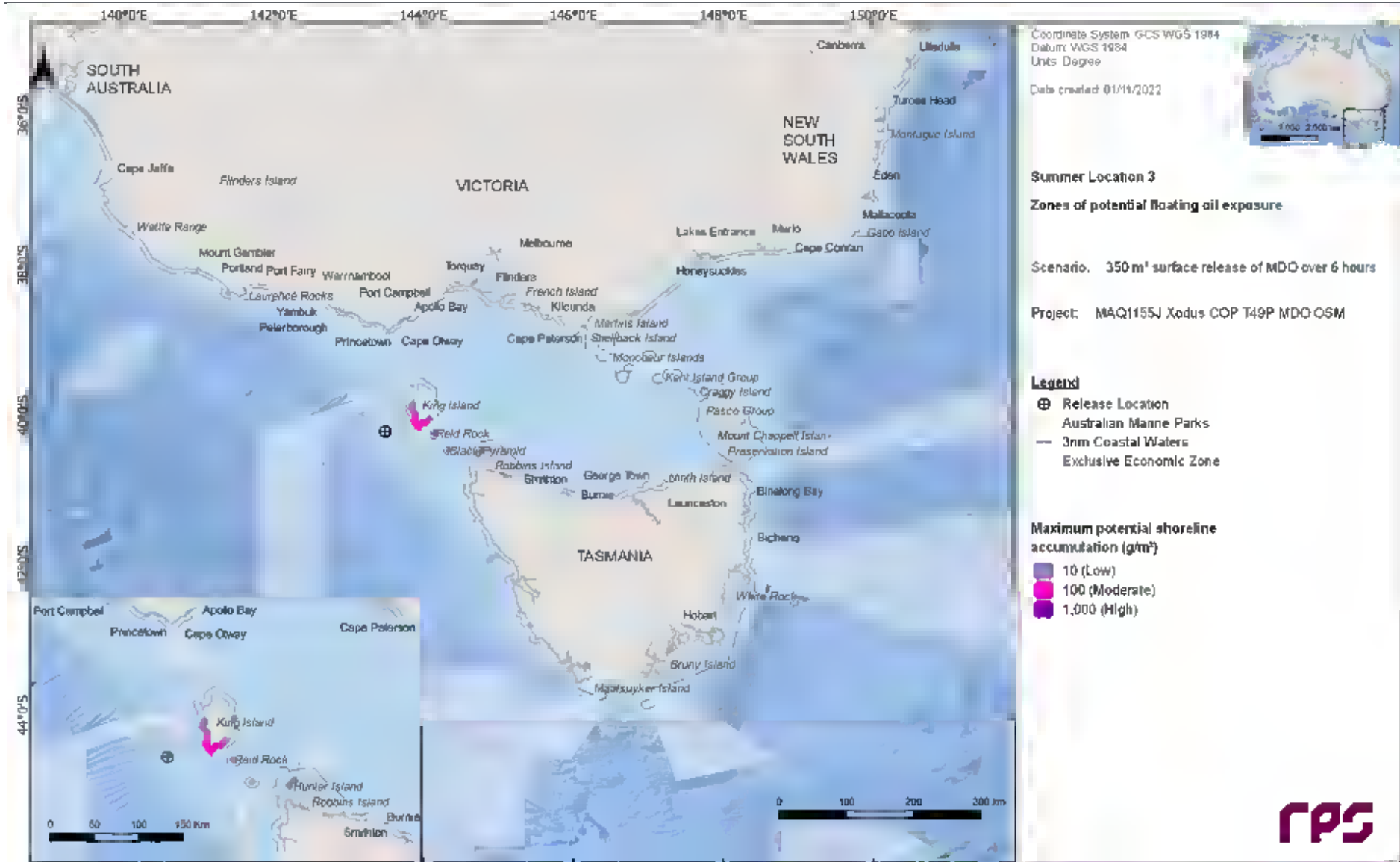


Figure 14.4 Maximum potential shoreline loading from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

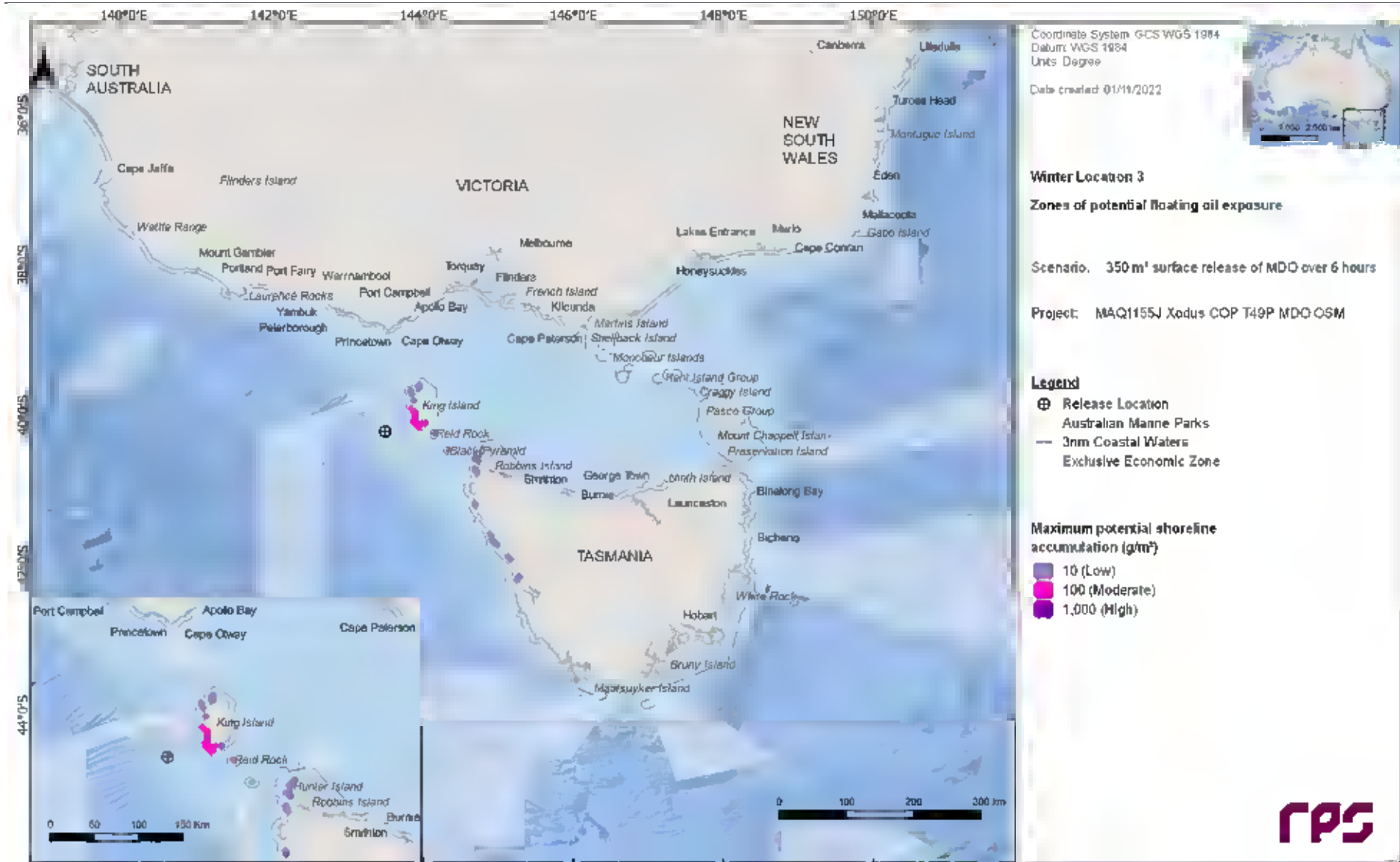


Figure 14.5 Maximum potential shoreline loading from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

14.2.3 In-water exposure

14.2.3.1 Dissolved Hydrocarbons

Table 14.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 14.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 14.6 and Figure 14.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 14.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	68	15	-
	Maximum distance (km) from release location (99 th percentile)	58	15	-
	Direction	S	NNE	-
Winter	Maximum distance (km) from release location	94	7	-
	Maximum distance (km) from release location (99 th percentile)	71	7	-
	Direction	E	SSW	-

Table 14.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer			Winter				
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High rate
AMP	Zeehan	20	1	-	-	8	-	-	-
IBRA	King Island	11	1	-	-	16	1	-	-
IMCRA	Central Bass Strait	7	-	-	-	13	1	-	-
	Otway	113	60	8	-	133	76	15	-
KEF	West Tasmania Canyons	51	6	1	-	22	1	-	-
Near Shore Waters	King Island	11	1	-	-	8	-	-	-
	Reid Rock	7	-	-	-	16	1	-	-
State Waters	Tasmania	21	1	-	-	27	1	-	-

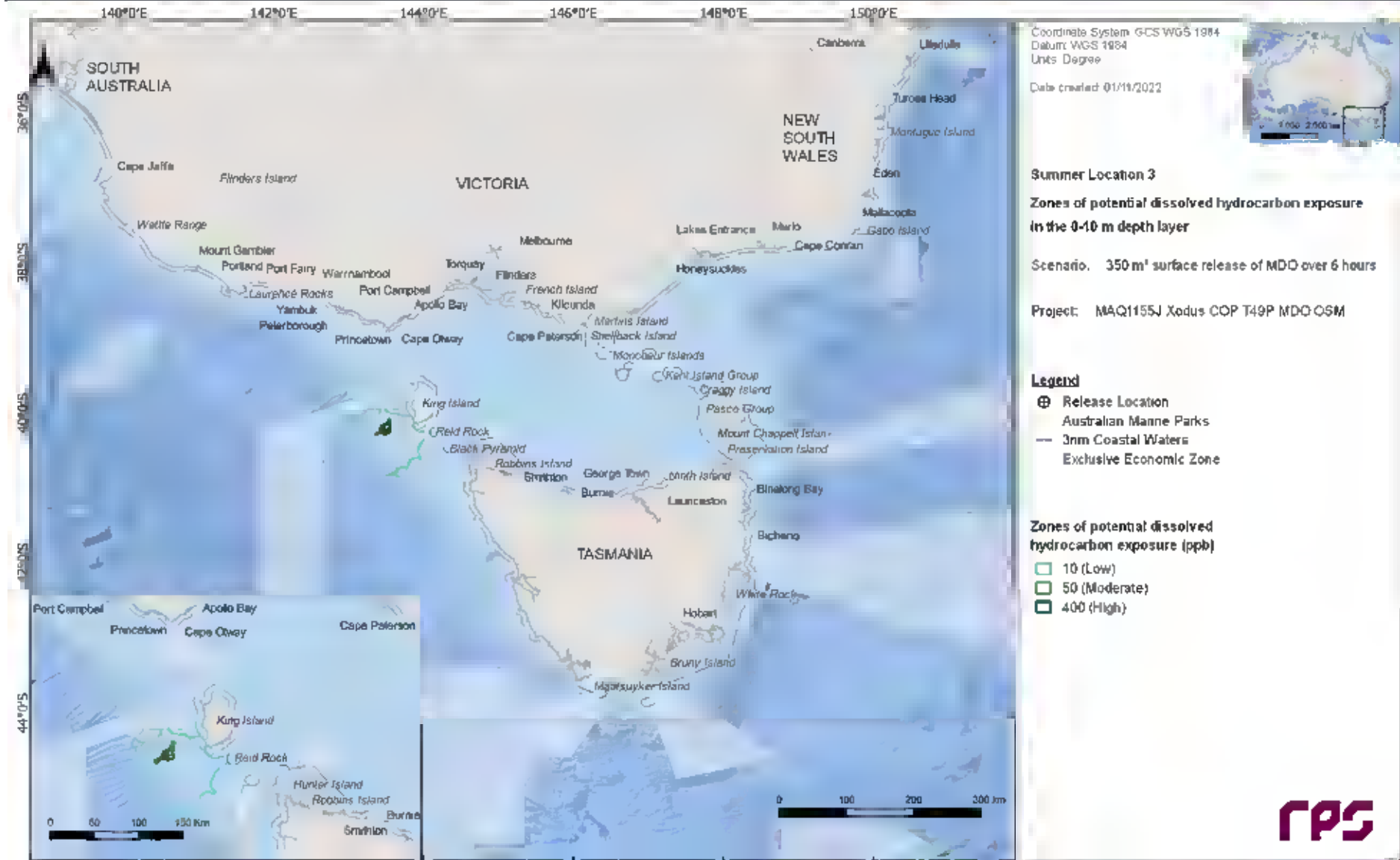


Figure 14.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

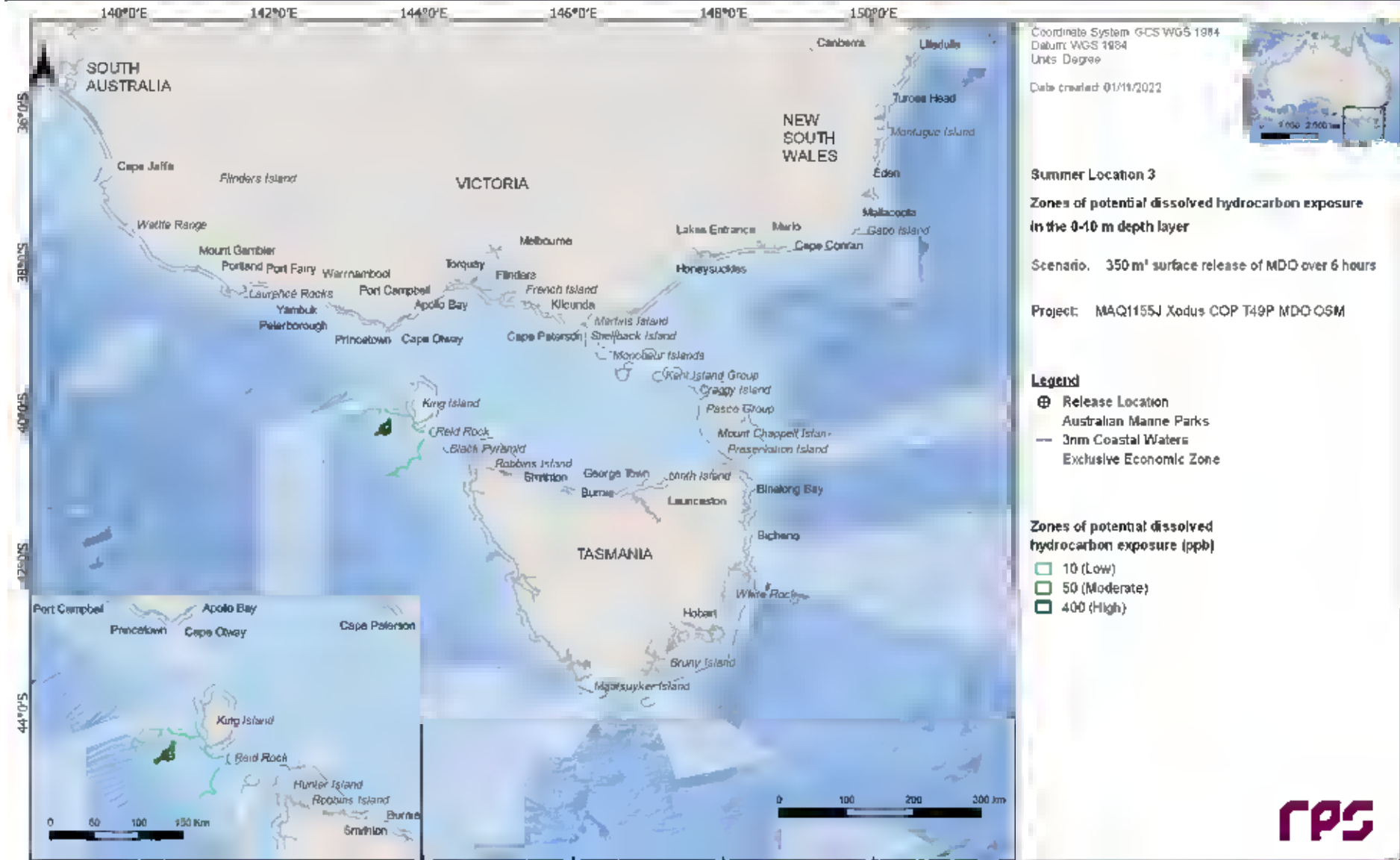


Figure 14.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

14.2.3.2 Entrained Hydrocarbons

Table 14.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 14.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 14.8 and Figure 14.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 14.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	374	130
	Maximum distance (km) from release location (99 th percentile)	348	109
	Direction	SSE	SSE
Winter	Maximum distance (km) from release location	497	157
	Maximum distance (km) from release location (99 th percentile)	411	131
	Direction	ENE	E

Table 14.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer			Winter		
		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
			Low	High		Low	High
AMP	Apollo	12	1	-	31	2	-
	Beagle	9	-	-	20	3	-
	Boags	55	9	-	127	20	1
	Franklin	182	12	3	193	31	4
	Tasman Fracture	6	-	-	14	1	-
	Zeehan	779	10	3	338	7	1
IBRA	Flinders	8	-	-	19	3	-
	King Island	328	27	4	348	39	5
	Tasmanian West	22	2	-	29	2	-
IMCRA	Boags	74	9	-	127	17	2
	Central Bass Strait	120	21	2	224	44	6
	Davey	7	-	-	20	2	-
	Flinders	11	2	-	29	5	-
	Franklin	119	9	1	134	14	1
	Otway	8,934	99	98	11,532	98	95
	Twofold Shelf	8	-	-	17	3	-
KEF	Upwelling East of Eden	4	-	-	11	1	-
	West Tasmania Canyons	1,834	39	19	730	14	6
NP	Kent Group	8	-	-	16	3	-
Ramsar	Lavinia	22	4	-	8	-	-
RSB	Bell Reef	165	23	4	380	35	6
	Brown Rocks	16	2	-	30	7	-
	Wakitipu Rock	1	-	-	14	2	-
Nearshore Waters	Albatross Island	28	6	-	93	13	-
	Black Pyramid	157	13	1	182	29	1
	Circular Head	22	3	-	31	8	-
	Curtis Island	1	-	-	13	1	-
	Hogan Island Group	6	-	-	16	2	-
	Hunter Island	33	3	-	34	8	-
	Huon Valley	-	-	-	19	1	-
	Kent Island Group	8	-	-	16	3	-
	King Island	328	27	3	348	23	3
	Pyramid Island	3	-	-	19	2	-
	Reid Rock	145	25	5	272	39	6
	Three Hummock Island	15	1	-	18	4	-
	West Coast	22	2	-	29	2	-
State Waters	Tasmania	367	32	7	463	41	12

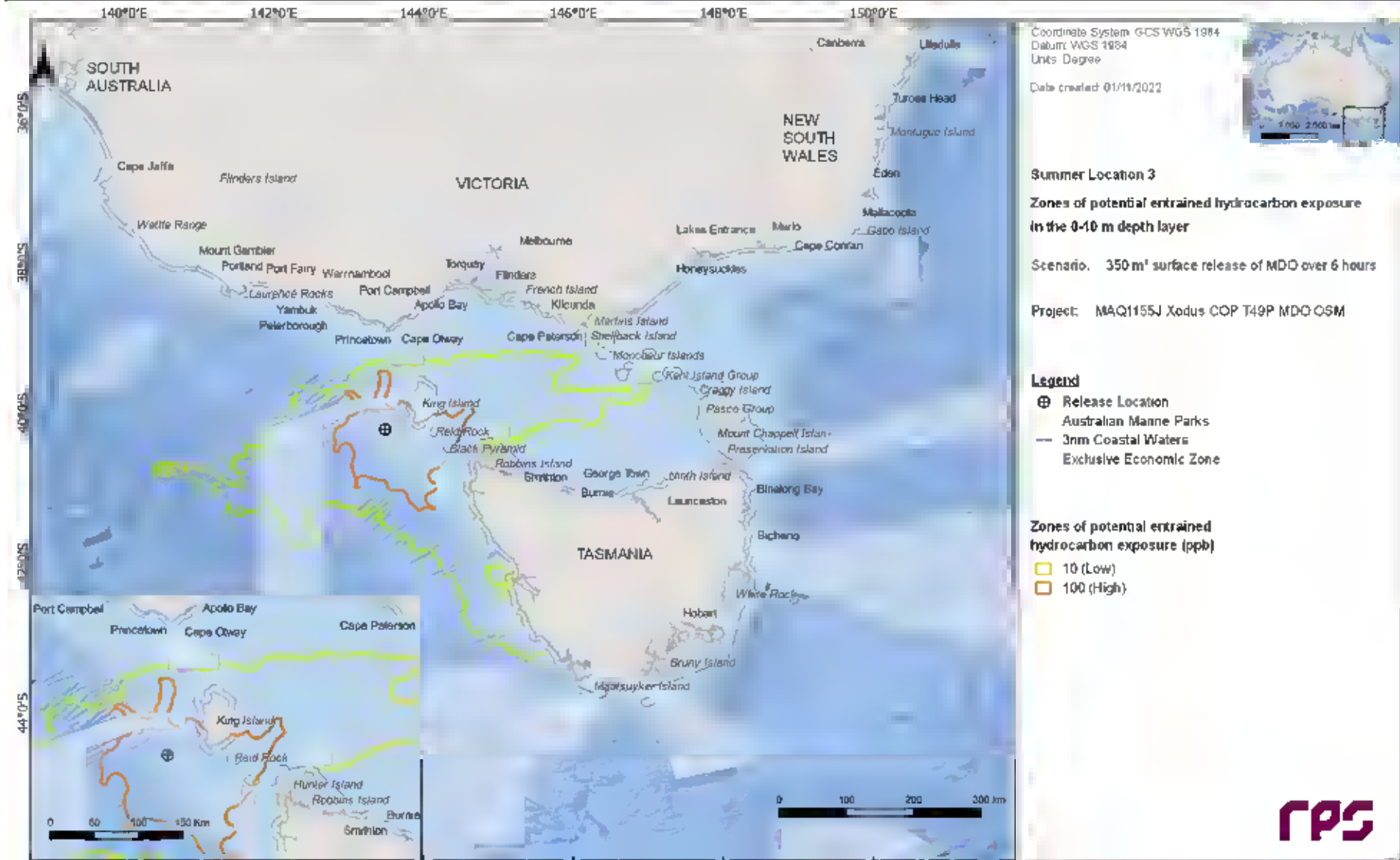


Figure 14.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

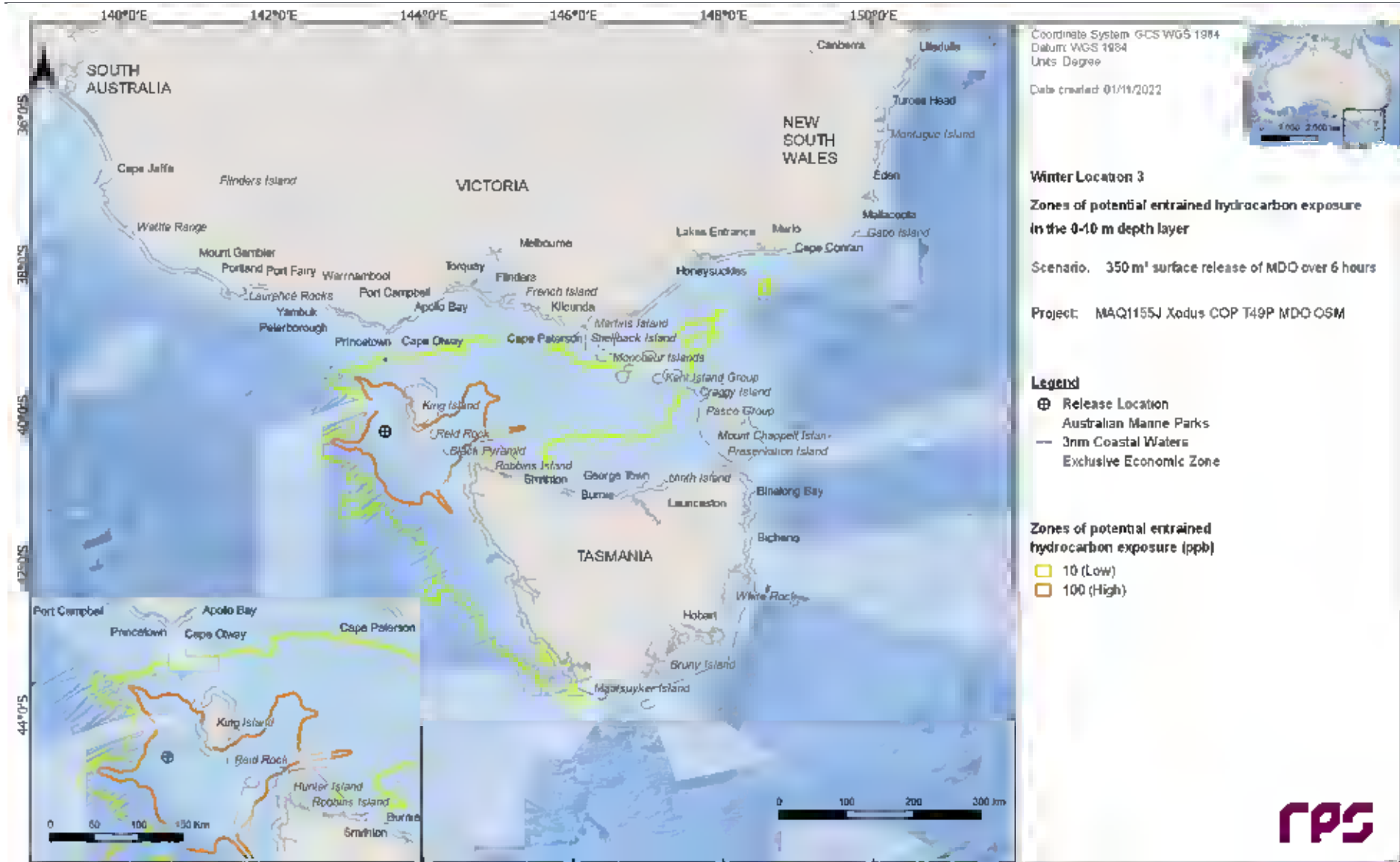


Figure 14.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

14.3 Deterministic Analysis

14.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of oil ashore was identified as run number 83 and commenced during winter conditions, 9 pm 20th August 2013.

Figure 14.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 2.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 30 days are presented in Figure 14.11 and Figure 14.12, respectively.

Figure 14.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 156 m³ (~45%) was lost to the atmosphere through evaporation. Approximately, 110 m³ (~31%) of the released volume decayed, while approximately 66 m³ (~19%) was predicted to remain within the water column and approximately 18 m³ (~5%) was present on the shorelines.

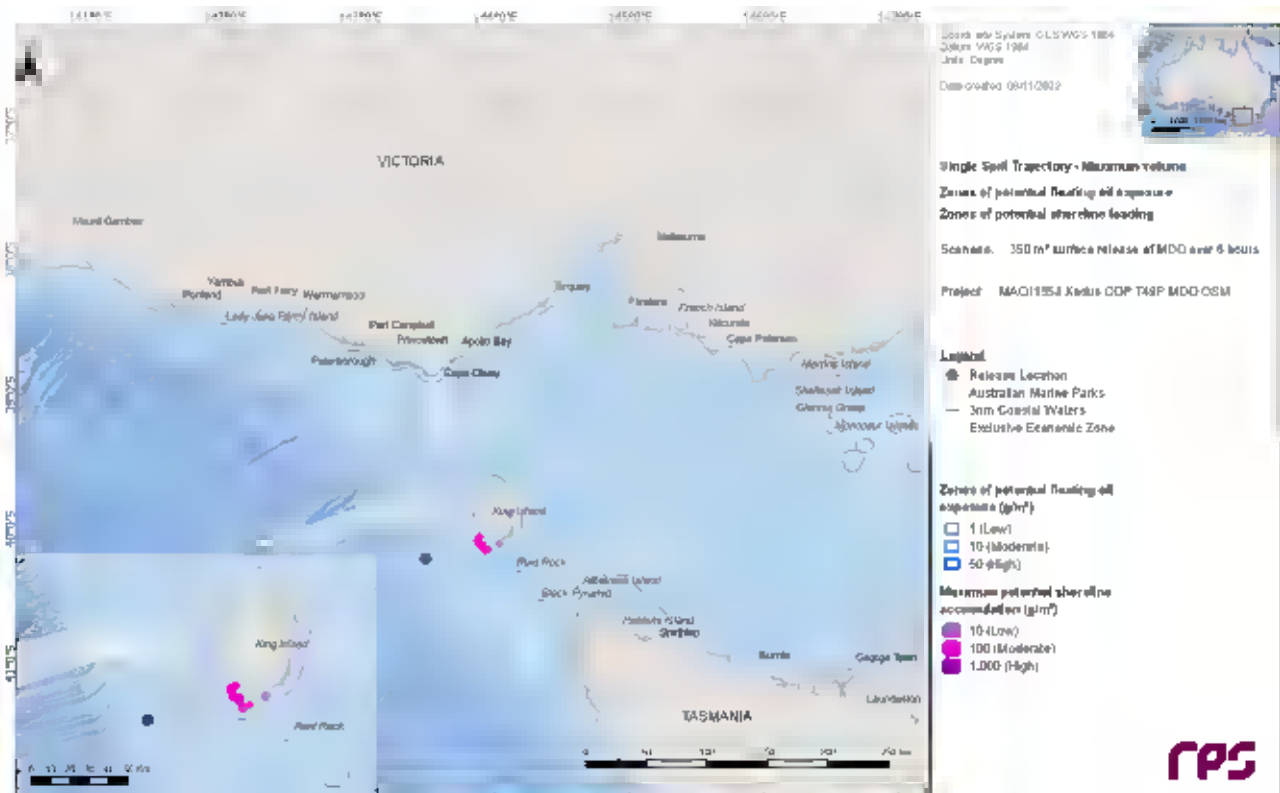


Figure 14.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

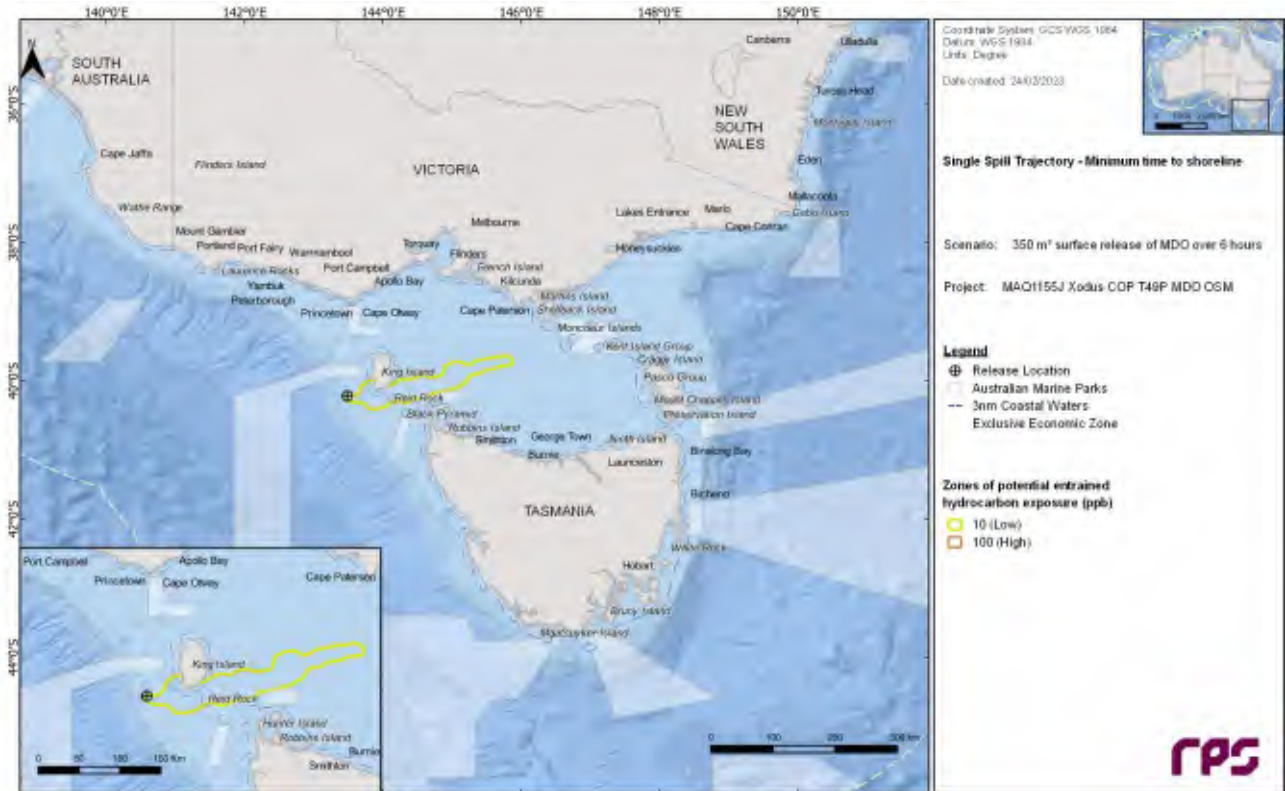


Figure 14.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

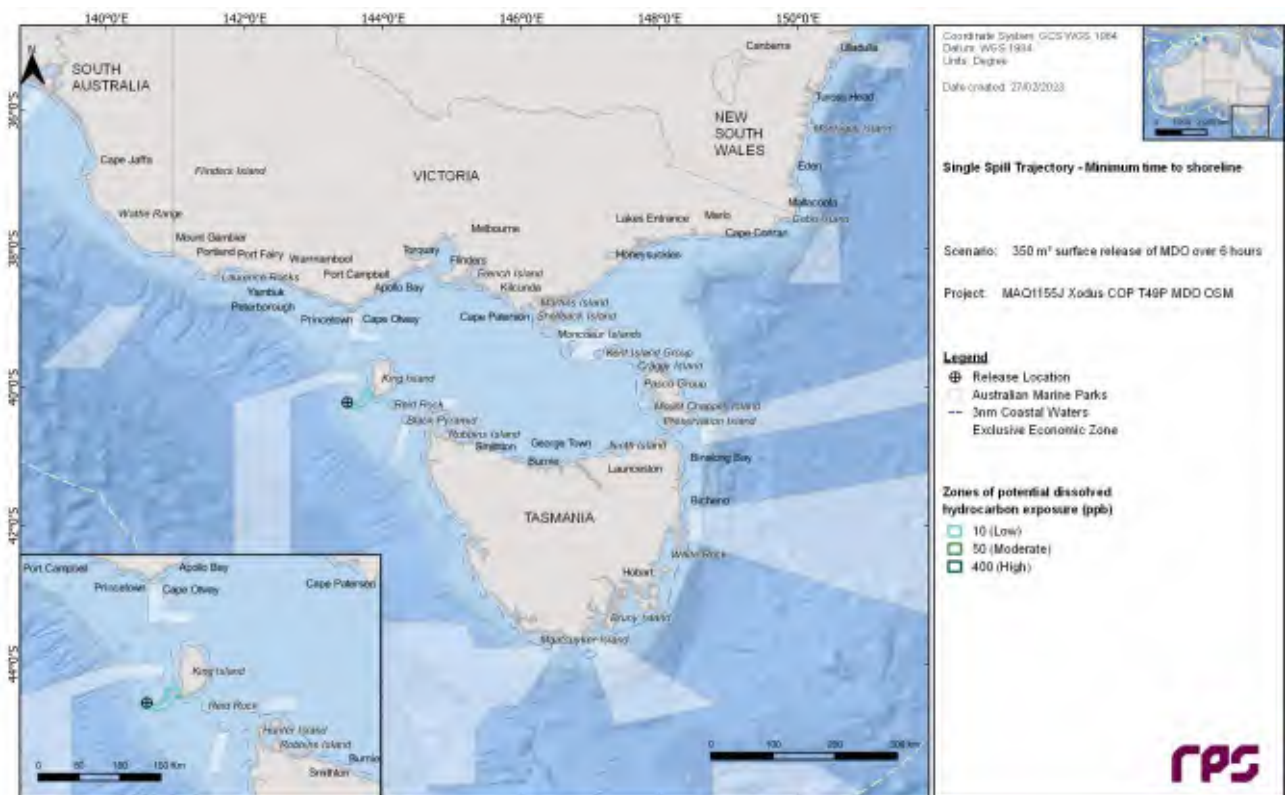


Figure 14.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

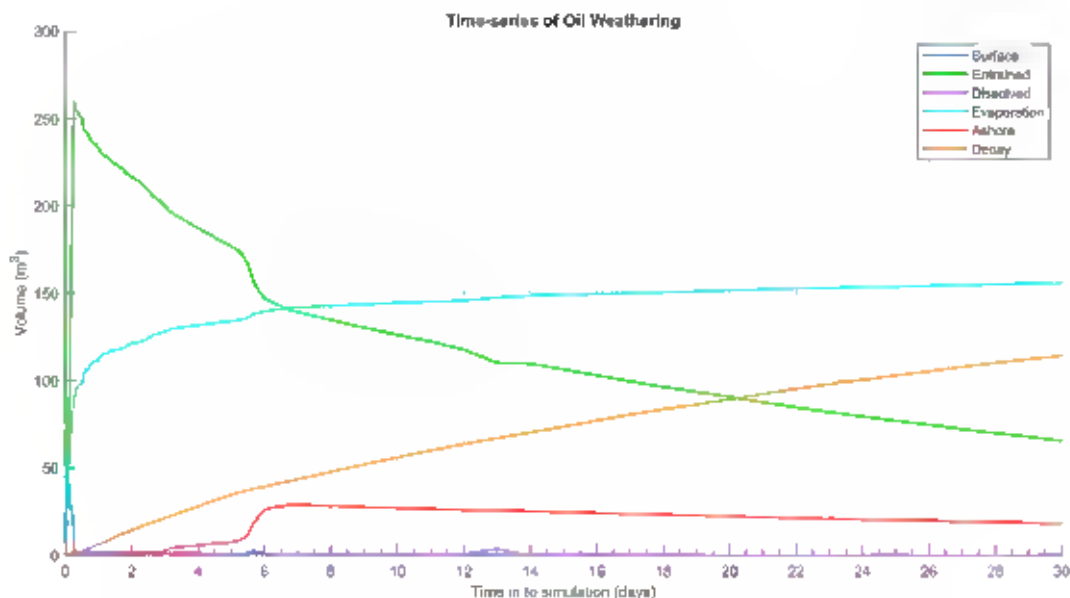


Figure 14.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

14.3.2 Largest Area of Floating Oil Exposure

The simulation that resulted in the largest swept area of floating hydrocarbon exposure at or above the low exposure threshold of 170.6 km² was identified as run number 60 and commenced during winter conditions, 3 pm 27th August 2014.

Figure 14.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). No shoreline accumulation was predicted during the simulation.

The extent of the predicted entrained hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 30 days is presented in Figure 14.15. No zones of dissolved hydrocarbon exposure were predicted for the simulation.

Figure 14.16 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 194 m³ (~55%) was lost to the atmosphere through evaporation. Approximately, 87 m³ (~25%) of the released volume decayed, while approximately 71 m³ (~20%) was predicted to remain within the water column.

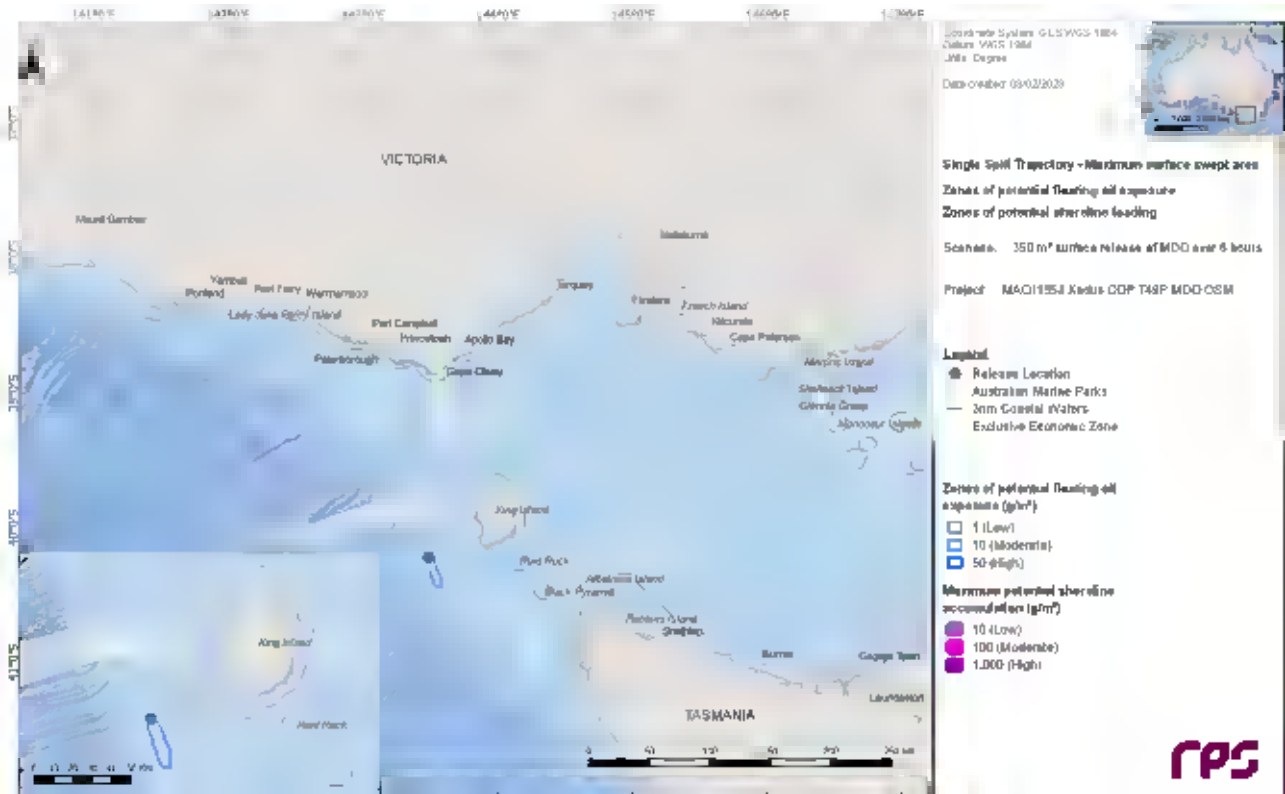


Figure 14.14 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest area of floating hydrocarbon exposure from a vessel collision at Location 3.

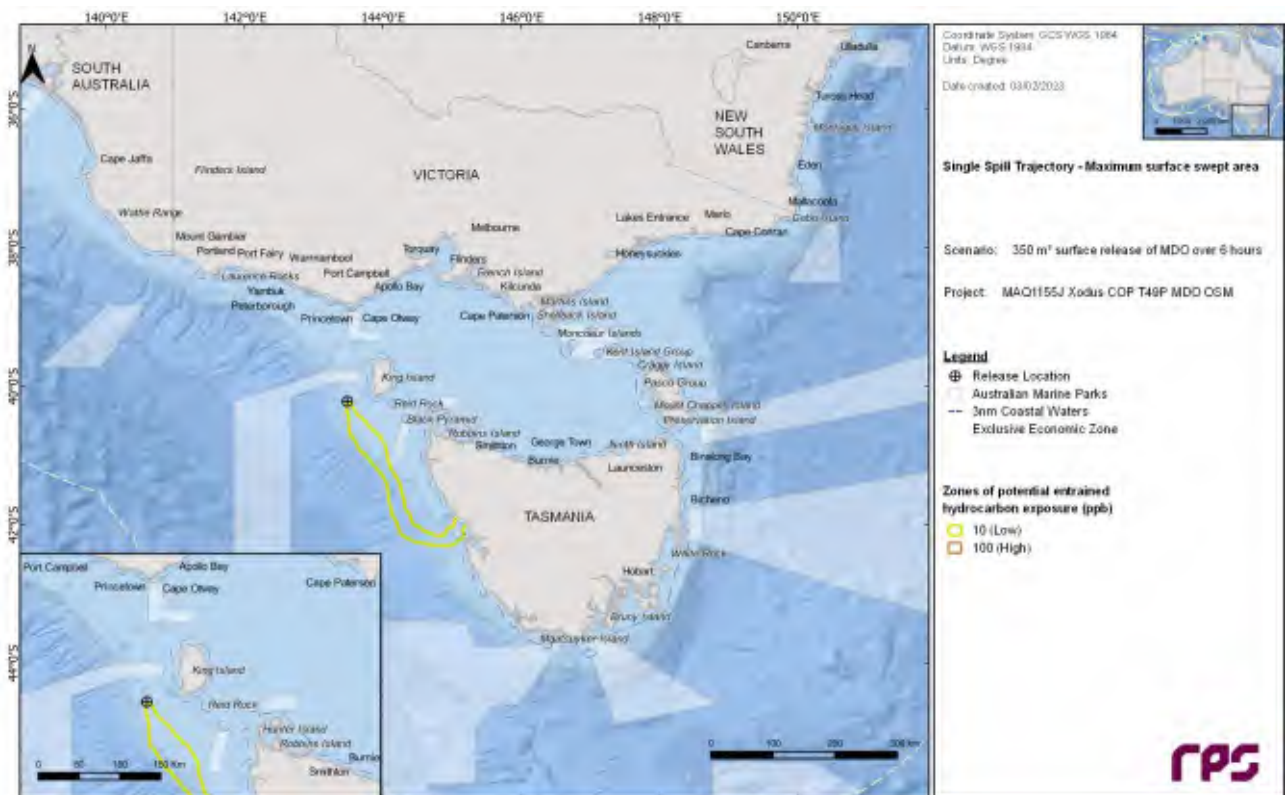


Figure 14.15 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest area of floating hydrocarbon exposure from a vessel collision at Location 3.

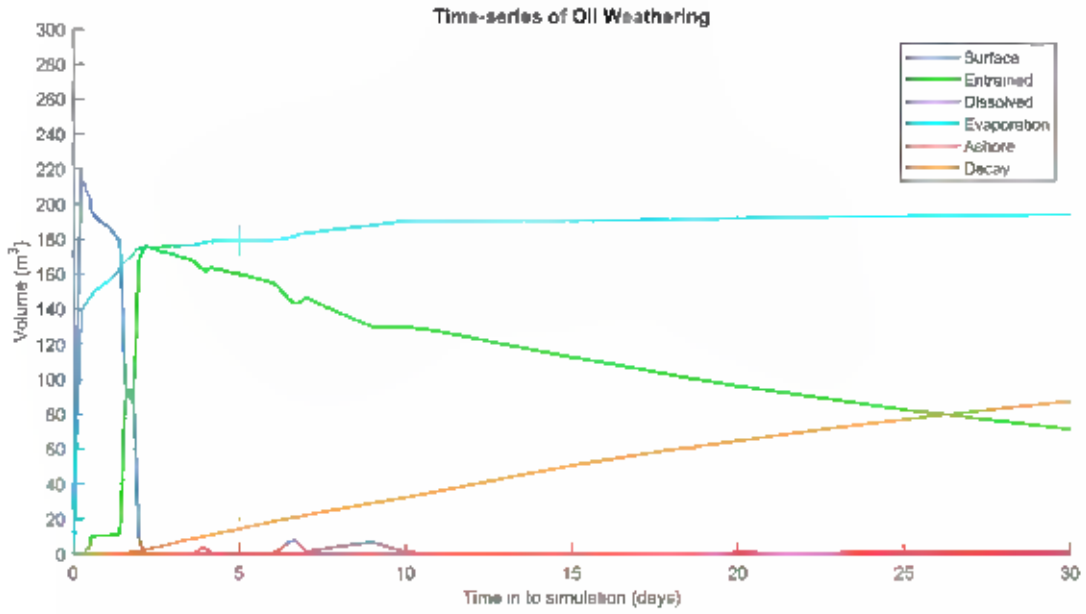


Figure 14.16 Predicted weathering and fates for the simulation that led to the largest area of floating hydrocarbon exposure from a vessel collision at Location 3.

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TERMS AND ABBREVIATIONS

°	Degrees
'	Minutes
"	Seconds
µm	Micrometre (unit of length; 1 µm = 0.001 mm)
Actionable oil	Oil which is thick enough for the effective use of mitigation strategies
AMP	Australian Marine Park
AMSA	Australian Maritime Safety Authority
AMOP	Arctic and Marine Oil Spill Program
ANZECC	Australian and New Zealand Environment and Conservation Council
API	American Petroleum Institute gravity. A measure of how heavy or light a petroleum liquid is compared to water.
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASTM	American Society for Testing and Materials
BMSL	Below mean sea level
Bonn Agreement	An agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, 1983, includes: Governments of the Kingdom of Belgium, the Kingdom of Denmark, the French Republic, the Federal Republic of Germany, the Republic of Ireland, the Kingdom of the Netherlands, the Kingdom of Norway, the Kingdom of Sweden, the United Kingdom of Great Britain and Northern Ireland and the European Union.
BP	Boiling point. The temperature at which the vapor pressure of the liquid is equal to the pressure exerted on it by the surrounding atmosphere
BTEX	Benzene, toluene, ethylbenzene, and xylenes
°C	Degree Celsius (unit of temperature)
CFSR	Climate Forecast System Reanalysis
cm	Centimetre (unit of length)
ConocoPhillips	ConocoPhillips Australia SH1 Pty Ltd
cP	Centipoise (unit of dynamic viscosity)
Decay	The process where oil components are changed either chemically or biologically (biodegradation) to another compound. It includes breakdown to simpler organic carbon compounds by bacteria and other organisms, photo-oxidation by solar energy, and other chemical reactions.
Dynamic viscosity	The dynamic viscosity of a fluid expresses its resistance to shearing flows, where adjacent layers move parallel to each other with different speeds.
Floating oil exposure	Contact by floating oil on the sea surface at concentrations equal to or exceeding defined threshold concentrations. The consequence will vary depending on the threshold and the receptors
g/m ²	Grams per square meter (unit of surface area density)
GEP	Gas export pipeline
GODAE	Global Ocean Data Assimilation Experiment
HYCOM	Hybrid Coordinate Ocean Model. A data-assimilative, three-dimensional ocean model

REPORT

HYDROMAP	Advanced ocean/coastal tidal model used to predict tidal water levels, current speed and current direction.
IBRA	Interim Biogeographic Regionalisation for Australia
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
ITOPF	International Tanker Owners Pollution Federation Limited
KEF	Key Ecological Feature
km	Kilometre (unit of length)
km ²	Square kilometres (unit of area)
Knots	Unit of speed (1 knot = 0.514 m/s)
LOWC	Loss of well control
m	Meter (unit of length)
m ³	Cubic meter (unit of volume)
m/s	Meter per second (unit of speed)
MAHs	Monoaromatic hydrocarbons
MMA	Marine Management Area
MP	Marine Park
NASA	National Aeronautics and Space Administration (USA)
NCEP	National Centres for Environmental Prediction (USA)
nm	Nautical mile
NOAA	National Oceanic and Atmospheric Administration (USA)
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NP	National Park
NR	Nature Reserve
NRC	National Research Council
PAH	Polynuclear aromatic hydrocarbons
Pour point	The pour point of a liquid is the temperature below which the liquid loses its flow characteristics
ppb	Parts per billion (concentration)
psu	Practical salinity units
psia	Pounds per square inch (absolute)
Ramsar site	A site listed under the Ramsar Convention on wetlands which is an international intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.
RSB	Reefs, Shoals and Banks
scf/bbl	Standard cubic feet of gas per barrel of oil
Shoreline accumulation	Arrival of oil at or near shorelines at on-water concentrations equal to or exceeding defined threshold concentrations. Shoreline contact is judged for floating oil arriving within a 2 km buffer zone from any shoreline as a conservative measure
SIMAP	Spill Impact Model Application Package. SIMAP is designed to simulate the fate and effects of spilled hydrocarbons for surface or subsea releases

REPORT

Single Oil spill modelling	Oil spill modelling involving a computer simulation of a single hypothetical oil spill event subject to a single sequence of wind, current and other sea conditions over time. Single oil spill modelling, also referred to as “deterministic modelling” provides a simulation of one possible outcome of a given spill scenario, subject to the metocean conditions that are imposed. Single oil spill modelling is commonly used to consider the fate and effects of ‘worst-case’ oil spill scenarios that are carefully selected in consideration of the nature and scale of the offshore petroleum activity and the local environment (NOPSEMA, 2017). Because the outcomes of a single oil spill simulation can only represent the outcome of that scenario under one sequence of metocean conditions, worst-case conditions are often identified from stochastic modelling. It is impossible to calculate the likelihood of any outcome from a single oil spill simulation. Single oil spill modelling is generally used for response planning, preparedness planning and for supporting oil spill response operations in the event of an actual spill
SRTM	Shuttle Radar Topography Mission
Stochastic oil spill modelling	Stochastic oil spill modelling is created by overlaying and statistically analysing the outcomes of many single oil-spill simulations of a defined spill scenario, where each simulation was subject to a different sequence of metocean conditions, selected objectively (typically by random selection) from a long sequence of historic conditions for the study area. Analysis of this larger set of simulations provides a more accurate indication of the environment that maybe affected (EMBA) and indicates which locations are more likely to be affected (as well as other statistics). Stochastic oil spill modelling avoids biases that affect single oil spill modelling (due to the reliance on only one possible sequence of conditions). However, when interpreting stochastic modelling, which is based on a wide range of potential conditions that might happen to occur, it is essential to understand that calculations will encompass a much larger area than could be affected in any single spill event, where a more limited set of conditions will occur. Consequently, it is misleading to imply that the region derived from stochastic modelling indicate the outcomes expected from a single spill event (NOPSEMA, 2017) Stochastic modelling is generally used for risk assessment and preparedness planning by indicating locations that could be exposed and may require response or subsequent impact assessment
Summer	October to March
TOPEX/Poseidon	A joint satellite mission between NASA and CNES to map ocean surface topography using an array of satellites equipped with detailed altimeters
USA	United States of America
Winter	April to September
WGS 1984	World Geodetic System 1984 (WGS84); reference coordinate system
World Ocean Atlas	A collection of objectively analysed quality controlled physicochemical parameters (e.g. temperature, salinity, oxygen, phosphate, silicate, and nitrate) based on profile data from the World Ocean Database established by NOAA’s National Centers for Environmental Information (NCEI)

EXECUTIVE SUMMARY

Background

ConocoPhillips Australia SH1 Pty Ltd (ConocoPhillips) is considering an exploration drilling campaign in Permit T/49P, in Commonwealth waters. The closest points of the permit area is 23.5 km from the west coast of King Island and 26 km from the Victorian coast. Water depths in the permit area range from 70 m to 1,000 m, with approximately 90% of the survey area being in water depths less than 150 m.

An oil spill modelling study was undertaken to assess the potential exposure from a subsea loss of well control (LOWC) from 3 worst case target locations due to the extent of the permit area. Specifically, the scenario assessed was a 139,400 m³ subsea release of condensate over 90 days (1,549 m³/day).

The study assessed the potential risk of exposure to the surrounding waters and shorelines for two seasons, summer months (October to March) and winter conditions (April to September). This approach assists with identifying the environmental values and sensitive regions/receptors that would be at risk of exposure on a seasonal basis, given the dominant winds and water currents that vary among the seasons.

The purpose of the modelling is to provide an understanding of the conservative 'outer envelope' of the potential area that may be affected in the unlikely event of a vessel based spill. Since, the modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill, the results presented herein are conservative.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Program (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

Methodology

The modelling study was carried out in stages. Firstly, a 10-year current dataset (2010 – 2019) that includes the combined influence of large-scale ocean and nearshore tidal currents was developed. Secondly, the currents, local winds and detailed hydrocarbon characteristics were used as inputs in the three-dimensional oil spill model (SIMAP) to simulate the drift, spread, weathering and fate of the spilled hydrocarbons.

As spills can occur during any set of wind and current conditions, modelling was conducted using a stochastic (or statistical) approach, which involved running 100 spills modelled for each scenario, per season, with each simulation having the same information (i.e. location volume and condensate properties) and randomly selected start times. This ensured that each simulation was subjected to different wind and current conditions and, in turn, movement and weathering of the condensate. The results were combined to determine the potential exposure to the surrounding waters, shorelines and sensitive receptors based on the NOPSEMA thresholds.

The SIMAP system, methods and analysis presented herein, use modelling algorithms which have been anonymously peer reviewed and published in international journals. Further, RPS warrants that this work meets and exceeds the ASTM Standard F2067-13 "*Standard Practice for Development and Use of Oil Spill Models*".

Condensate Properties

Thylacine condensate was used as a proxy, which has an API of 44.3, a density of 805 kg/m³ (at 15°C) and a low viscosity value of 0.875 cP. The volatile to semi-volatile components (boiling point (BP) < 265 °C), which represent approximately 83% of the whole condensate is likely to evaporate over the first day if exposed to the atmosphere at local temperatures, leaving the less volatile portion (16%) to progressively evaporate more slowly. Only 1% of the condensate is considered persistent.

Thylacine condensate is categorised as a group I oil (non – persistent oil) according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges. The heavier components (i.e low volatile portion) of the condensate will tend to entrain into the upper water column during the presence of moderate winds (> 10 knots) and can potentially remain entrained for as long as the winds persist. But can subsequently resurface when the winds ease, and waves abate.

Key Findings

Location 1

- The maximum distance from the release location to the low (1 g/m²) and moderate (10 g/m²) floating oil exposure thresholds was 275.0 km (summer), 13.6 km (summer and winter), respectively. No floating oil exposure at the high (50 g/m²) threshold was predicted.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during winter at 100%, while the minimum time before shoreline accumulation at the low threshold was 8.29 days predicted during winter. The maximum total volume of oil ashore was predicted during the winter with 20.0 m³.
- The maximum distance from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 769 km (winter), 722 km (winter) and 452 km (winter), respectively.
- The maximum distance from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 833 km (winter) and 666 km (summer), respectively.

Location 2

- The maximum distance from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 147.4 km (winter), 42.7 km (summer and winter) and 0.3 km (summer and winter), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was 100% during both summer and winter, while the minimum time before shoreline accumulation at the low threshold was 3.21 days predicted during winter. The maximum total volume of oil ashore was predicted during the winter with 196.6 m³ (over the duration of the simulation).
- Maximum distance from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 703 km (winter), 483 km (winter) and 313 km (winter), respectively.
- The maximum distance from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 831 km (summer and winter) and 583 km (summer), respectively.

Location 3

- The maximum distance from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 196.2 km (winter), 15.4 km (summer) and 1.3 km (winter), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was 100% during both summer and winter, while the minimum time before shoreline accumulation at the low threshold was 4.00 days predicted during winter conditions. The maximum volume of oil ashore was predicted during the winter with 58.7 m³.
- Maximum distance from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 773 km (winter), 492 km (summer) and 308 km (summer), respectively.
- The maximum distance from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 846 km (winter) and 430 km (winter), respectively.

1 BACKGROUND

1.1 Introduction

ConocoPhillips Australia SH1 Pty Ltd (ConocoPhillips) is considering an exploration drilling campaign in Permit T/49P, in Commonwealth waters. The closest points from the permit area are the west coast of King Island (23.5 km east) and Victorian coastline (26 km north). Water depths in the permit area range from 70 m to 1,000 m, with approximately 90% of the survey area being in water depths less than 150 m.

Xodus on behalf of ConocoPhillips had commissioned RPS to undertake an oil spill modelling study to assess the potential exposure from a subsea loss of well control (LOWC) from 3 worst case target locations due to the extent of the permit area. The LOWC scenario was based on a 139,400 m³ subsea release of condensate over 90 days (1,549 m³/day). Table 1-1 presents the coordinates of the three release locations and Figure 1.1 is the location map.

The study assessed the potential risk of exposure to the surrounding waters and shorelines for two seasons, summer months (October to March) and winter conditions (April to September). This approach assists with identifying the environmental values and sensitive regions/receptors that would be at risk of exposure on a seasonal basis, given the dominant winds and water currents that vary among the seasons.

The purpose of the modelling is to further improve understanding of a conservative ‘outer envelope’ of the potential area that may be affected in the unlikely event of hydrocarbon release. The modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill. Therefore, the modelling results represent the maximum extent that the released hydrocarbons may influence.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Program (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

Note that the oil spill model, the method, and analysis presented herein uses modelling algorithms which have been anonymously peer reviewed and published in international journals. Furthermore, RPS warrants that this work meets and exceeds the American Society for Testing and Materials (ASTM) Standard F2067-13 “*Standard Practice for Development and Use of Oil Spill Models*”.

Table 1-1 T/49P hydrocarbon spill modelling release locations.

Release location	Latitude*	Longitude*	Water depth (m)
Location 1	39° 15' 46.6" S	143° 20' 26.4" E	93
Location 2	39° 47' 49.7" S	143° 30' 46.3" E	100
Location 3	40° 13' 5.3" S	143° 29' 10.9" E	114

*Datum: WGS 1984

REPORT

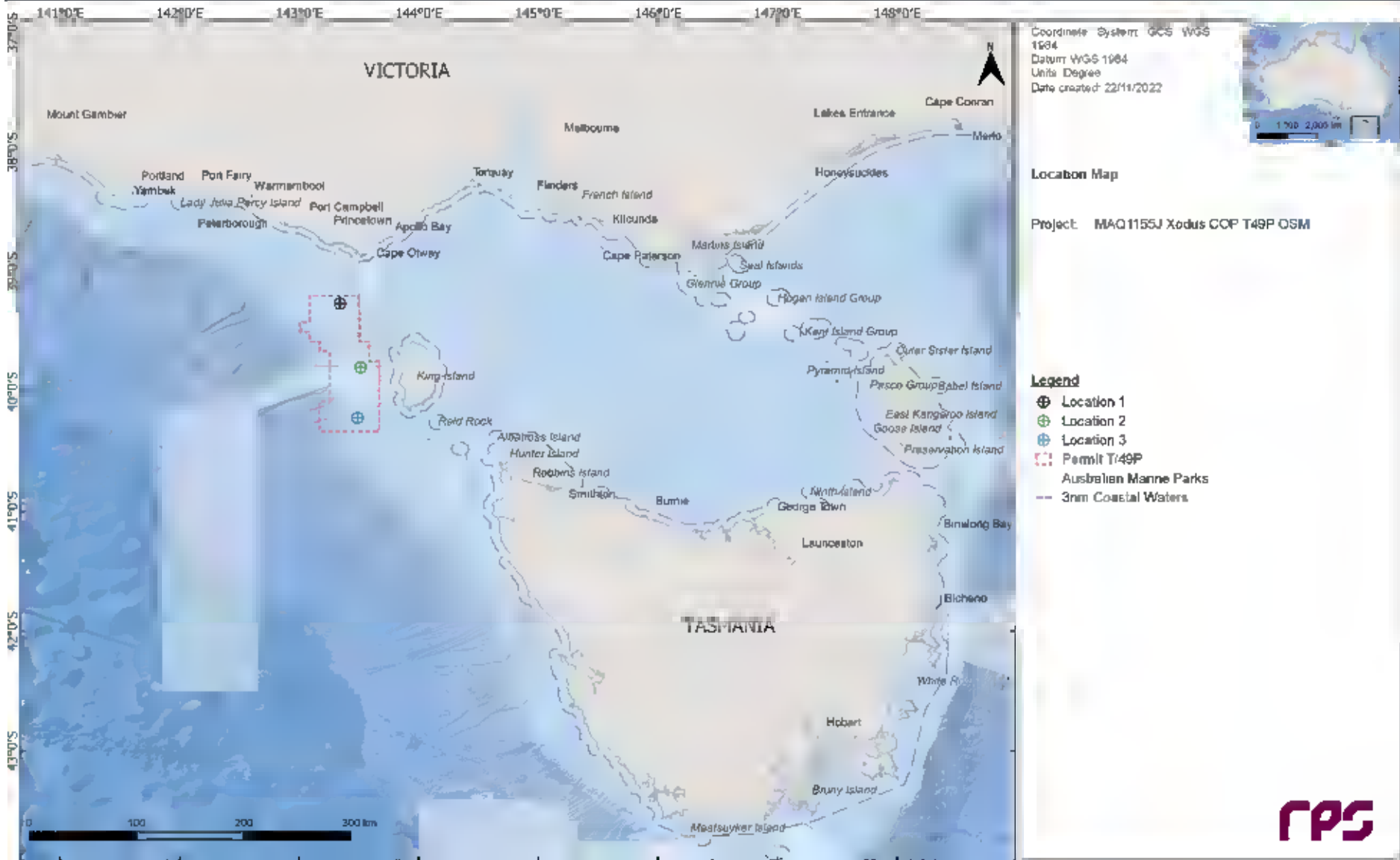


Figure 1.1 T/49P hydrocarbon spill modelling release locations.

1.2 What is Oil Spill Modelling?

Oil spill modelling is a valuable tool widely used for risk assessment, emergency response and contingency planning where it can be particularly helpful to proponents and decision makers. By modelling a series of the most likely oil spill scenarios, decisions concerning suitable response measures and strategic locations for deploying equipment and materials can be made, and the locations at most risk can be identified. The two types of oil spill modelling often used are stochastic (Section 1.2.1) and deterministic (Section 1.2.2) modelling.

1.2.1 Stochastic Modelling (Multiple Spill Simulations)

Stochastic oil spill modelling is created by overlaying a great number (often hundreds) of individual, computer-simulated hypothetical spills (NOPSEMA, 2018; Figure 1.2).

Stochastic modelling is a common means of assessing the potential risks from oil spills related to new projects and facilities. Stochastic modelling typically utilises hydrodynamic data for the location in combination with historic wind data. Typically, 100 iterations of the model will be run utilising the data that is most relevant to the season or timing of the project.

The outcomes are often presented as a probability of exposure and is primarily used for risk assessment purposes in view to understand the range of environments that may be affected or impacted by a spill. Elements of the stochastic modelling can also be used in oil spill preparedness and planning.

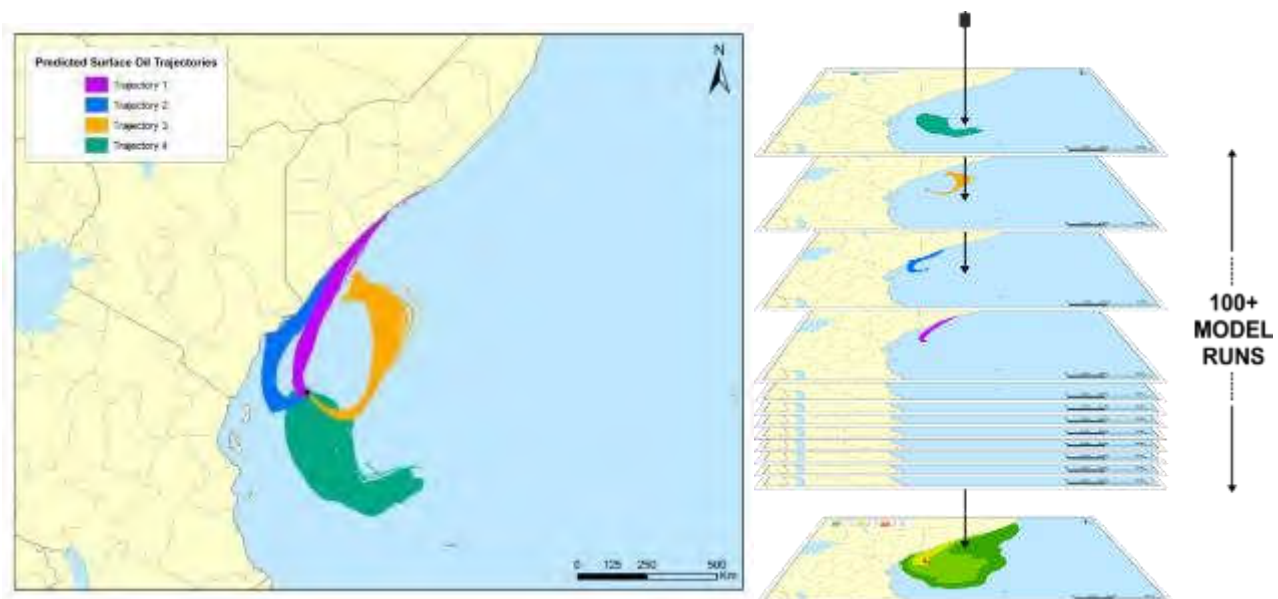


Figure 1.2 Examples of four individual spill trajectories (four replicate simulations) predicted by SIMAP for a spill scenario. The frequency of contact with given locations is used to calculate the probability of impacts during a spill. Essentially, all model runs are overlain (shown as the stacked runs on the right) and the number of times that trajectories contact a given location at a concentration is used to calculate the probability.

1.2.2 Deterministic Modelling (Single Spill Simulation)

Deterministic modelling is the predictive modelling of a single incident subject to a single sample of wind and weather conditions over time (NOPSEMA, 2018; Figure 1.3).

Deterministic modelling is often paired with stochastic modelling to place the large stochastic footprint into perspective. This deterministic analysis is generally a single run selected from the stochastic analysis and serves as the basis for developing the plans and equipment needs for a realistic spill response. Deterministic spills can be selected on based on parameters such as minimum time to shoreline, largest swept area, maximum volume ashore and longest length of shoreline contacted by hydrocarbons.

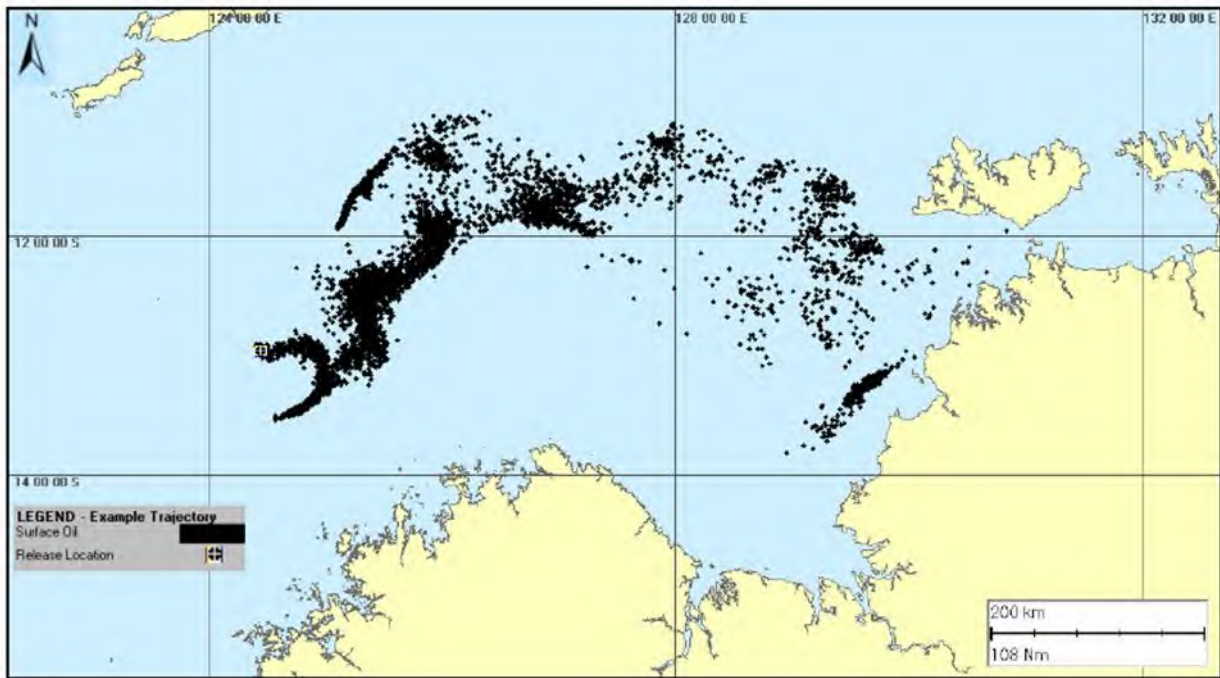


Figure 1.3 Example of an individual spill trajectory predicted by SIMAP for a spill scenario. Note, this image represents surface oil as spill and does not take any thresholds into consideration.

2 SCOPE OF WORK

The scope of work included the following components:

1. Generate ten years (2010 to 2019 (inclusive)) of wind and current data. The three-dimensional current data includes the combined influence of ocean and tidal currents;
2. Include the wind and current data and the condensate characteristics as input into the three-dimensional oil spill model, SIMAP, to model the movement, spreading, weathering and shoreline accumulation by hydrocarbons over time;
3. For each scenario, run 100 oil spill simulations per season (200 total per scenario), with each simulation having the same spill information (i.e. location, volume and condensate properties) but varying start times. This ensured that each spill trajectory was subjected to a unique set of wind and current conditions;
4. Combine the results from the 100 spill simulations (per season) to assess the exposure to waters and shoreline accumulation based upon the NOPSEMA thresholds;
5. Present the combined results from the 200 spill simulations, per scenario, to assess the low threshold environment that maybe affected (EMBA); and
6. From the 200 simulations modelled for each location identify and present the “worst case” deterministic run resulting in the maximum volume of hydrocarbons ashore. From the results for all three locations, identify and present the deterministic simulations resulting in: a) largest area of floating hydrocarbon exposure; b) minimum time to shoreline exposure; and c) longest length of shoreline accumulation.

3 REGIONAL CURRENTS

The Otway Basin lies within the western portion of the Bass Strait, a sea strait separating Tasmania from the southern Australian mainland. The strait is a relatively shallow area of the continental shelf, connecting the southeast Indian Ocean with the Tasman Sea. This region has a reputation for high winds and strong tidal currents (Jones, 1980). Currents are primarily driven by tides, winds and density driven flows. During winter the South Australian current moves dense, salty water eastward from the Great Australian Bight into the western margin of the Bass Strait (Sandery & Kämpf, 2007). In winter and spring, waters within the strait are well mixed with no obvious stratification, while during summer the central regions of the strait become stratified (Baines & Fandry, 1983; Middleton & Black, 1994).

Figure 3.1 displays seasonal current trends within the Otway Basin-Bass Strait region. During winter there is a strong eastward water flow due to the strengthening of the South Australian Current (fed by the Leeuwin Current in the Northwest Shelf), which bifurcates with one extension moving through the Bass Strait, and another forming the Zeehan Current off western Tasmania (Sandery & Kämpf, 2007). During summer, water flow reverses off Tasmania, King Island and the Otway Basin travelling eastward, as the coastal current develops due to south-easterly winds.

Therefore, to accurately account for the movement of an oil spill, which can move between the offshore and near shore region, ocean and tidal currents were combined as part of the study. The following sections provide a summary of the regional current data set.

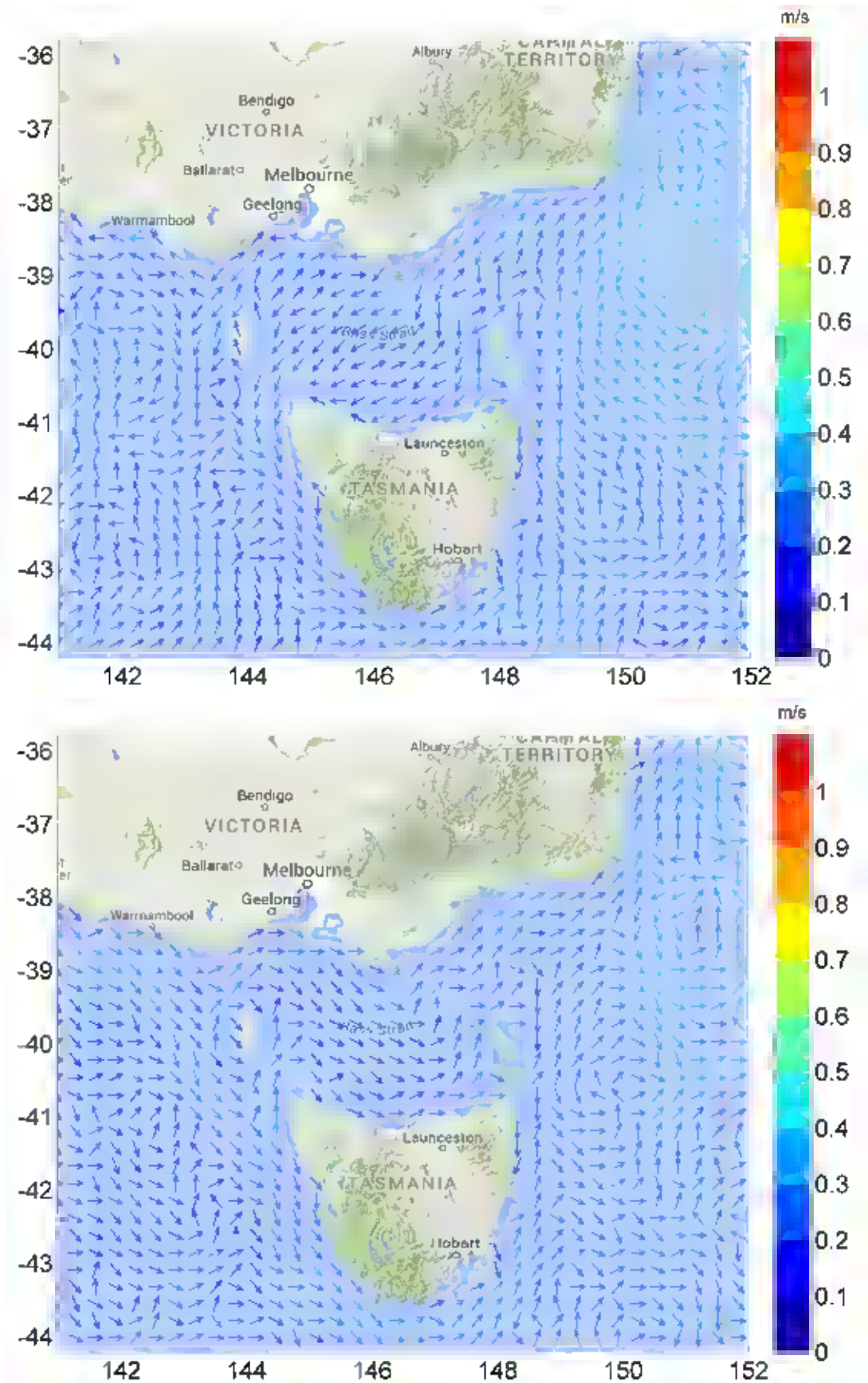


Figure 3.1 HYCOM averaged seasonal surface drift currents during summer (upper image) and winter (lower image).

3.1 Tidal currents

Tidal current data was generated using RPS's advanced ocean/coastal model, HYDROMAP. The HYDROMAP model has been thoroughly tested and verified through field measurements throughout the world for more than 30 years (Isaji & Spaulding, 1984; Isaji, et al., 2001; Zigic, et al., 2003). HYDROMAP tidal current data has been used as input to forecast (in the future) and hindcast (in the past) pollutant spills in Australian waters and forms part of the Australian National Oil Spill Emergency Response System operated by AMSA (Australian Maritime Safety Authority).

HYDROMAP employs a sophisticated sub-gridding strategy, which supports up to six levels of spatial resolution, halving the grid cell size as each level of resolution is employed. The sub-gridding allows for higher resolution of currents within areas of greater bathymetric and coastline complexity, and/or of interest to a study.

The numerical solution methodology follows that of Davies (1977a 1977b) with further developments for model efficiency by Owen (1980) and Gordon (1982). A more detailed presentation of the model can be found in Isaji & Spaulding (1984) and Isaji et al. (2001).

3.1.1 Grid Setup

The tidal model domain has been sub-gridded down to a resolution of 500 m for shallow and coastal regions, starting from an offshore (or deep water) resolution of 8 km. The finer grids were allocated in a step-wise fashion to resolve flows more accurately along the coastline, around islands and over regions with more complex bathymetry. Figure 3.2 shows the tidal model grid covering the study domain.

A combination of datasets was used and merged to describe the shape of the seabed within the grid domain (Figure 3.3). These included spot depths and contours which were digitised from nautical charts released by the hydrographic offices as well as Geoscience Australia database and depths extracted from the Shuttle Radar Topography Mission (SRTM30_PLUS) Plus dataset (see Becker et al., 2009).

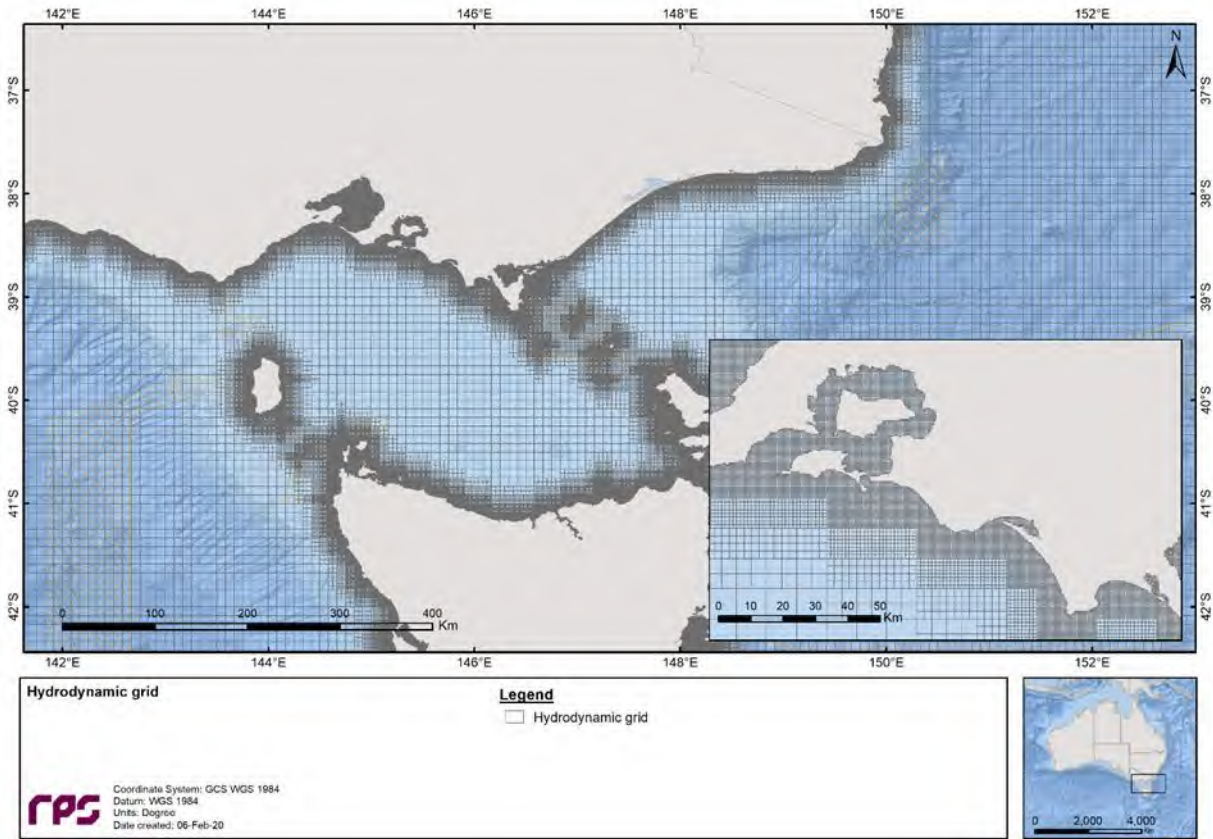


Figure 3.2 Sample of the model grid used to generate the tidal currents for the study region. Higher resolution areas are shown by the denser mesh.

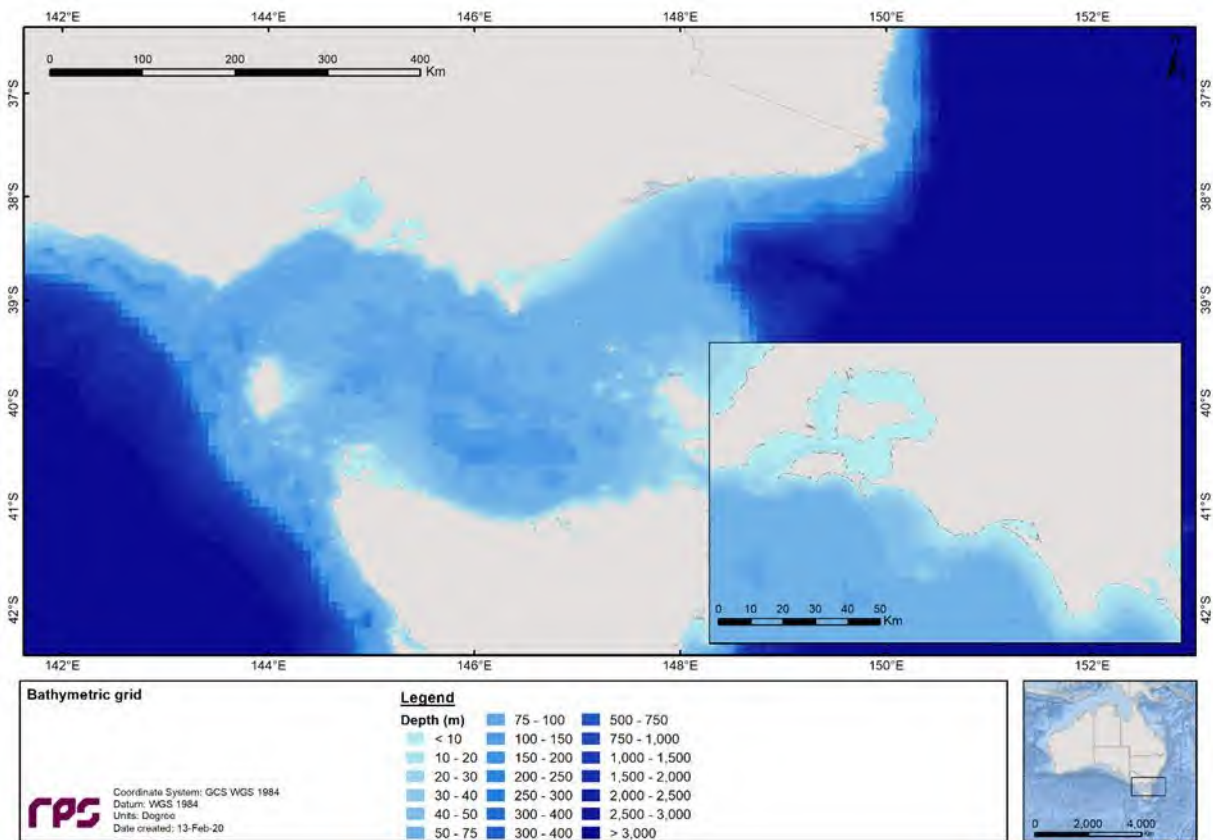


Figure 3.3 Bathymetry defined throughout the tidal model domain.

3.1.2 Tidal Conditions

The ocean boundary data for the regional model was obtained from satellite measured altimetry data (TOPEX/Poseidon 8.0) which provided estimates of the eight dominant tidal constituents at a horizontal scale of approximately 0.25 degrees. The eight major tidal constituents used were K_2 , S_2 , M_2 , N_2 , K_1 , P_1 , O_1 and Q_1 . Using the tidal data, time series surface heights were calculated along the open boundaries for the simulation period.

The Topex/Poseidon satellite data has a resolution of 0.25 degrees globally, with higher resolution in coastal regions, and is produced and quality controlled by NASA (National Aeronautics and Space Administration). The data capturing satellites, equipped with two altimeters capable of taking sea level measurements accurate to less than ± 5 cm, measured oceanic surface elevations (and the resultant tides) for the period 1992–2005. In total these satellites carried out 62,000 orbits of the planet. The Topex/Poseidon tidal data has been widely used amongst the oceanographic community, being referenced in more than 2,100 research publications (e.g., Andersen, 1995; Ludicone et al., 1998; Matsumoto et al., 2000; Kostianoy et al., 2003; Yaremchuk & Tangdong, 2004; Qiu & Chen, 2010). The Topex/Poseidon tidal data is considered suitably accurate for this study.

3.2 Ocean Currents

Data describing the flow of ocean currents was obtained from HYCOM (Hybrid Coordinate Ocean Model, (Chassignet et al., 2007), which is operated by the HYCOM Consortium, sponsored by the Global Ocean Data Assimilation Experiment (GODAE). HYCOM is a data-assimilative, three-dimensional ocean model that is run as a hindcast (for a past period), assimilating time-varying observations of sea surface height, sea surface temperature and in-situ temperature and salinity measurements (Chassignet et al., 2009). The HYCOM predictions for drift currents are produced at a horizontal spatial resolution of approximately 8.25 km ($1/12^{\text{th}}$ of a degree) over the region, at a frequency of three-times per day. HYCOM uses isopycnal layers in the open, stratified ocean, but uses the layered continuity equation to make a dynamically smooth transition to a terrain-following coordinate in shallow coastal regions, and to z-level coordinates in the mixed layer and/or unstratified seas.

For this study, the HYCOM hindcast currents were obtained for the years 2010 to 2019 (inclusive).

3.3 Surface Currents

Figure 3.4 to Figure 3.6 show the monthly current rose distributions for the three locations, while Figure 3.7 to Figure 3.9 illustrate the total current rose distributions.

Note the convention for defining current direction is the direction the current flows towards, which is used to reference current direction throughout this report. Each branch of the rose represents the currents flowing to that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent the current speed ranges for each direction. Speed intervals of 0.1 m/s are predominantly used in these current roses. The length of each coloured segment is relative to the proportion of currents flowing within the corresponding speed and direction.

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143 34°E, Latitude = 39 26°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020



Figure 3.4 Monthly surface current rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143 51°E, Latitude = 39 80°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020

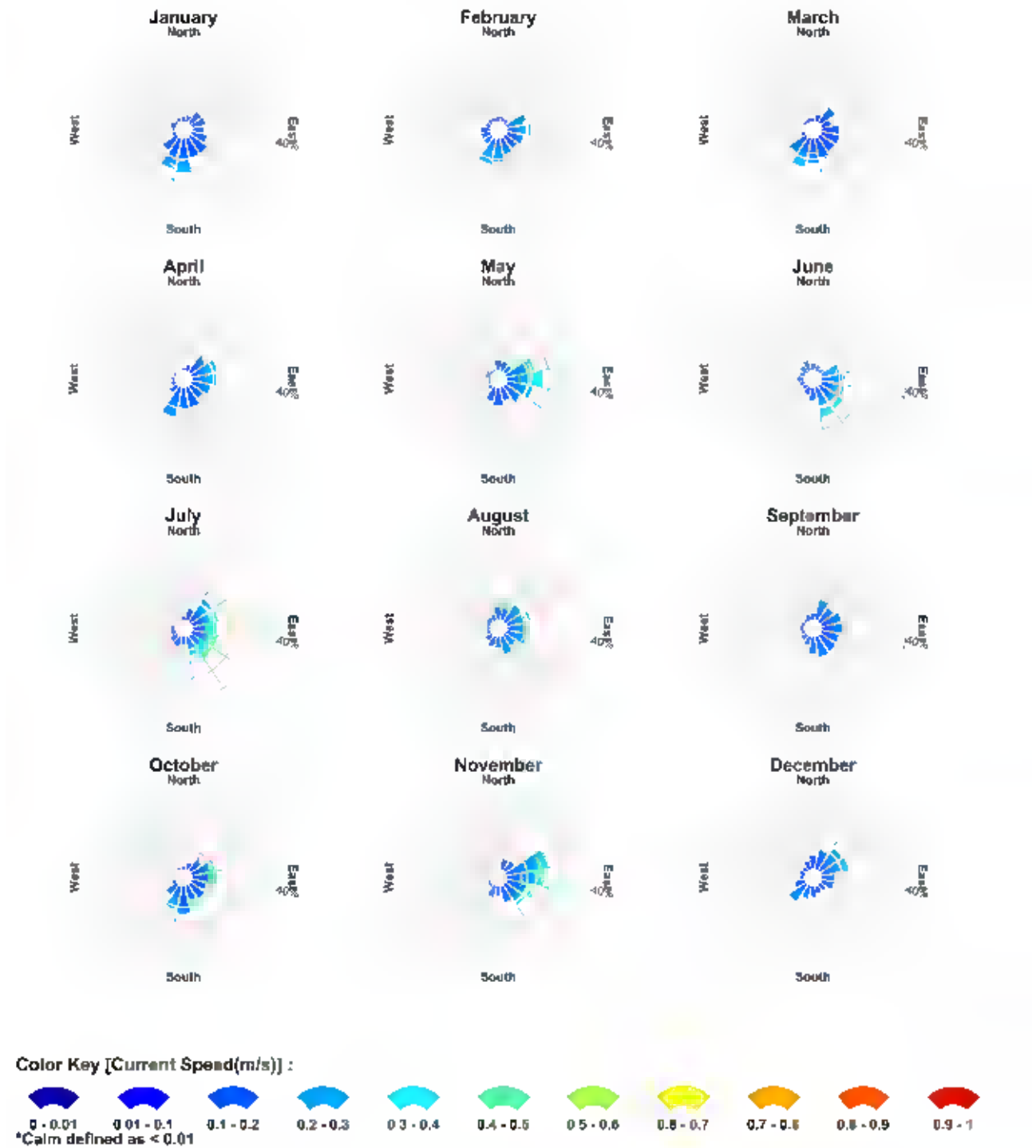


Figure 3.5 Monthly surface current rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143 49°E, Latitude = 40 22°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020

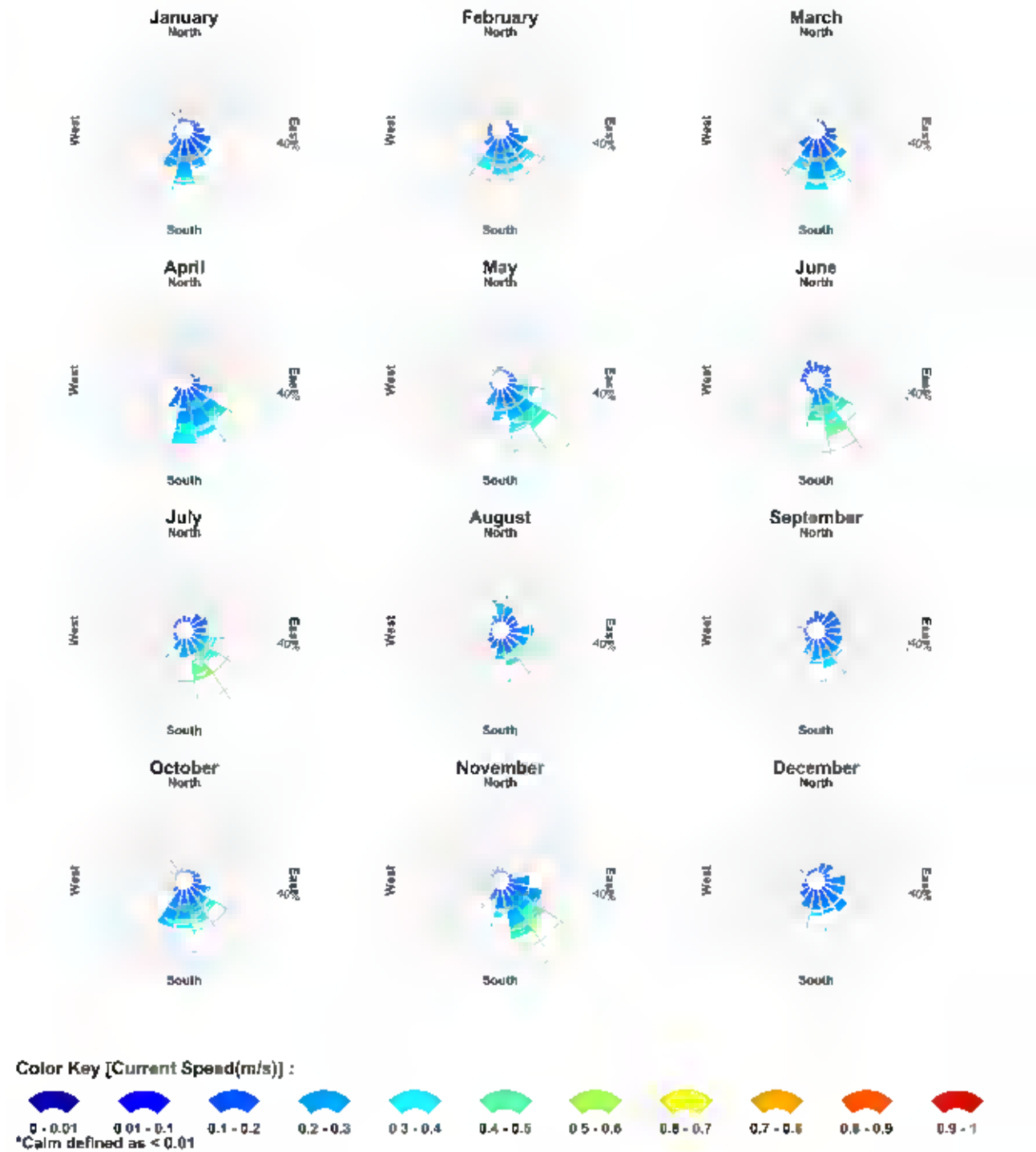


Figure 3.6 Monthly surface current rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143.34°E, Latitude = 39.26°S
 Analysis Period: 01-Jan-2019 to 02-Jan-2020

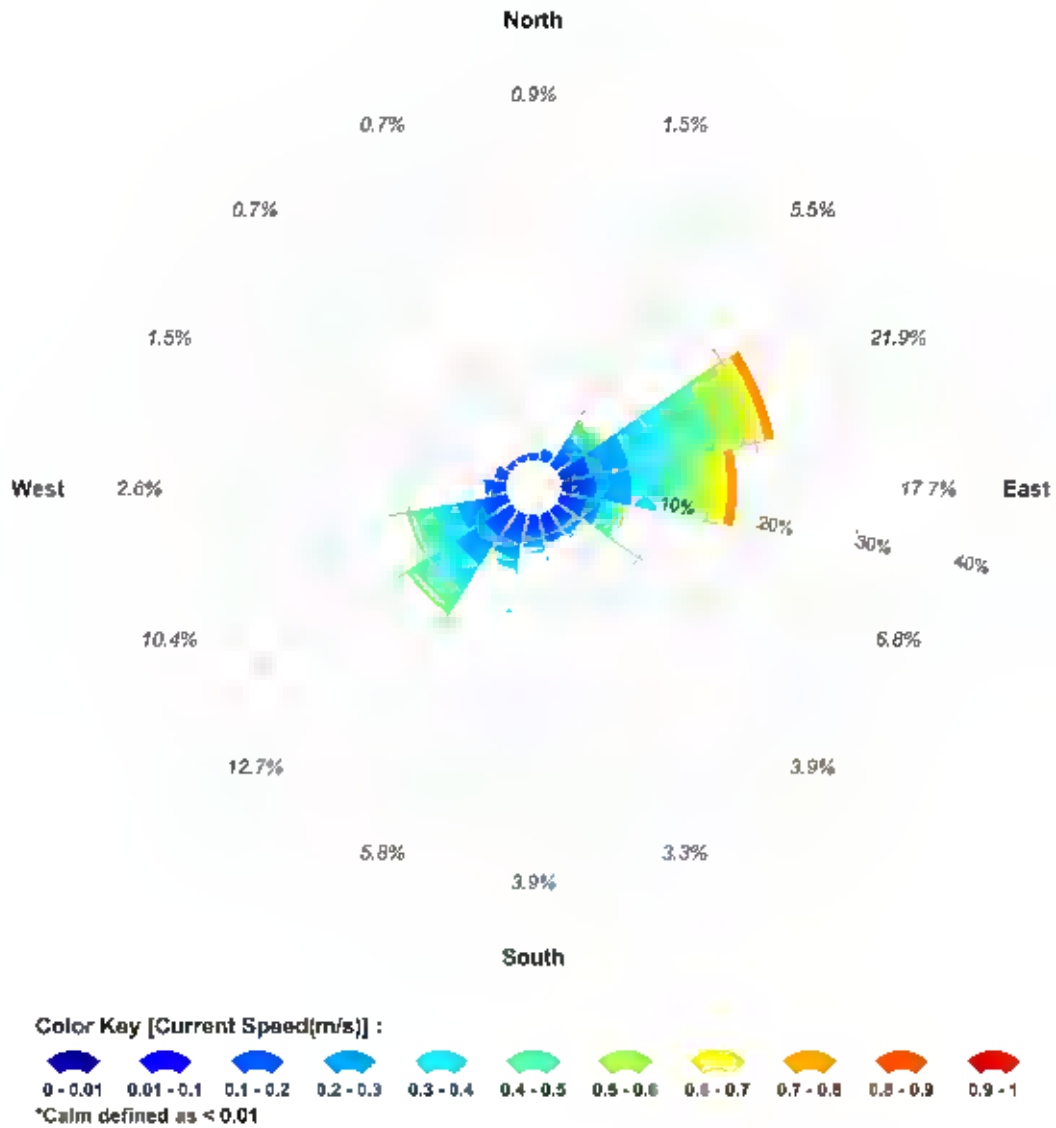


Figure 3.7 Total surface current rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143.51°E, Latitude = 39.80°S
 Analysis Period: 01-Jan-2019 to 02-Jan-2020

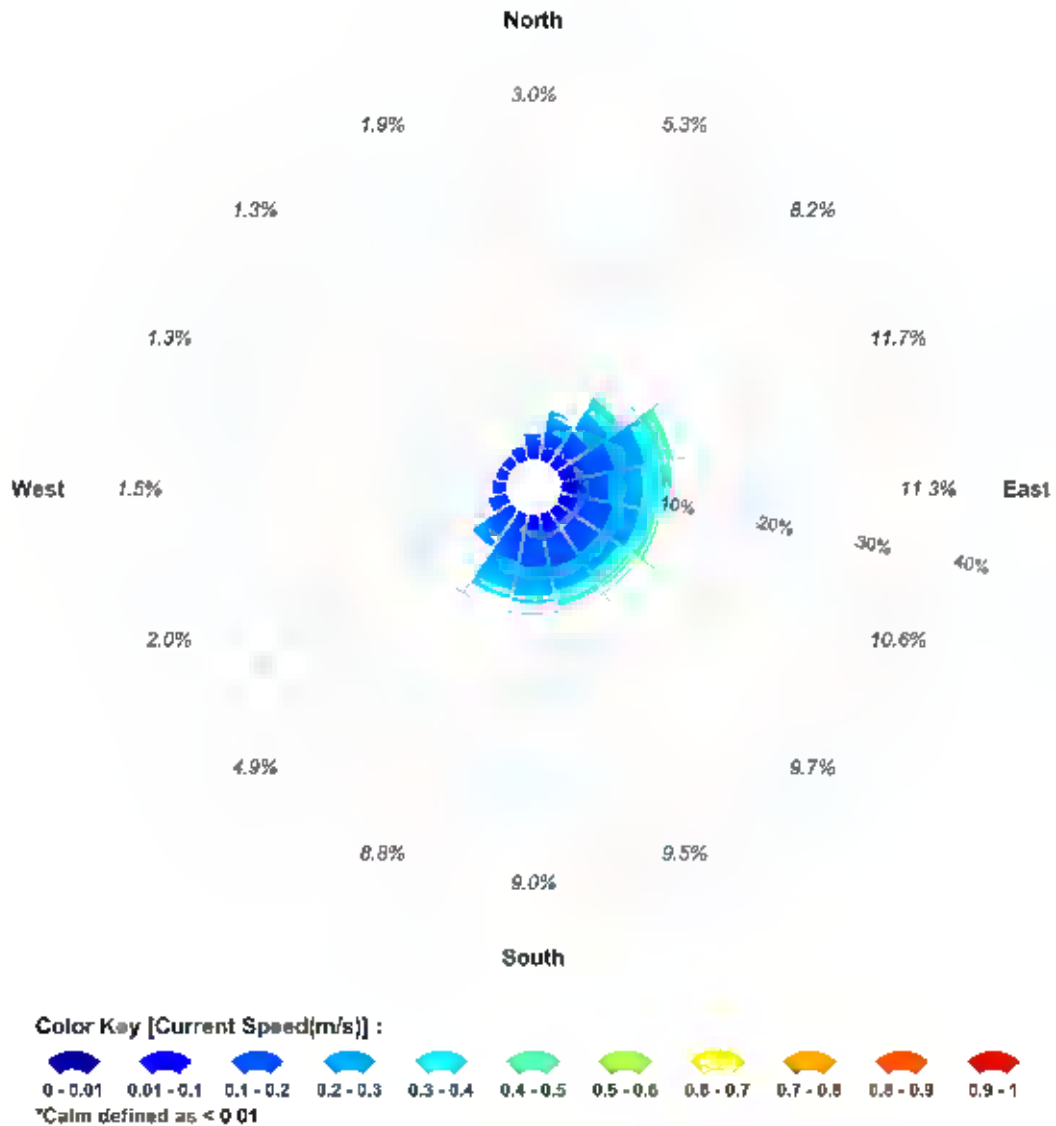


Figure 3.8 Total surface current rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 143.49°E, Latitude = 40.22°S
Analysis Period: 01-Jan-2019 to 02-Jan-2020

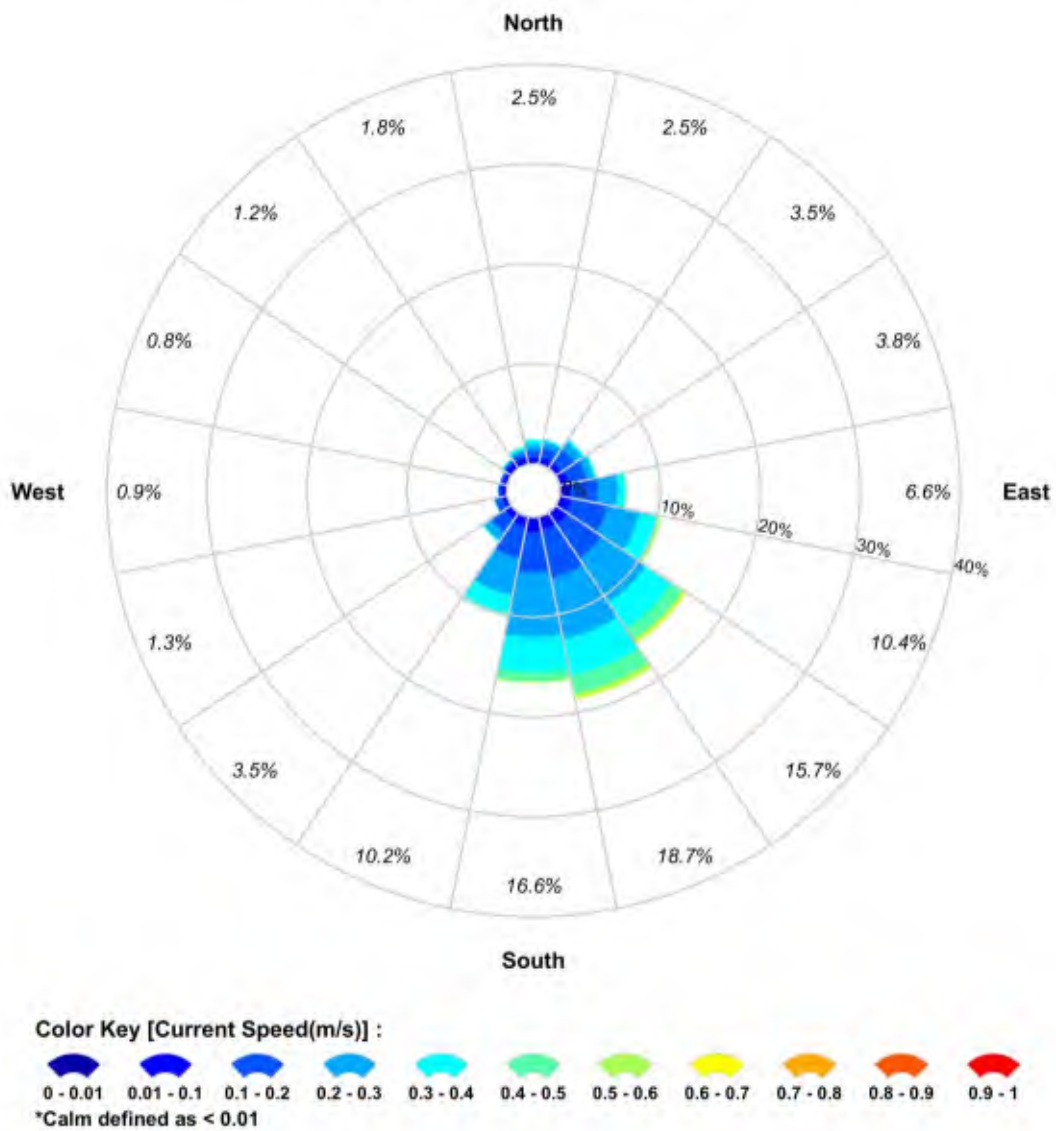


Figure 3.9 Total surface current rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

4 WIND DATA

To account for the influence of the wind on the hydrocarbons floating on the surface, wind data from 2010 to 2019 (inclusive) was sourced from the National Centre for Environmental Prediction (NCEP) Climate Forecast System Reanalysis dataset (CFSR; see Saha et al., 2010). The CFSR wind model includes observations from many data sources: surface observations, upper-atmosphere air balloon observations, aircraft observations and satellite observations. The model is capable of accurately representing the interaction between the earth’s oceans, land and atmosphere. The gridded wind data output is available at a horizontal resolution of 0.25° (~33 km) and a temporal resolution of 1 hour.

Figure 4.1 is a screenshot illustrating the spatial resolution of the CFSR modelled wind data.

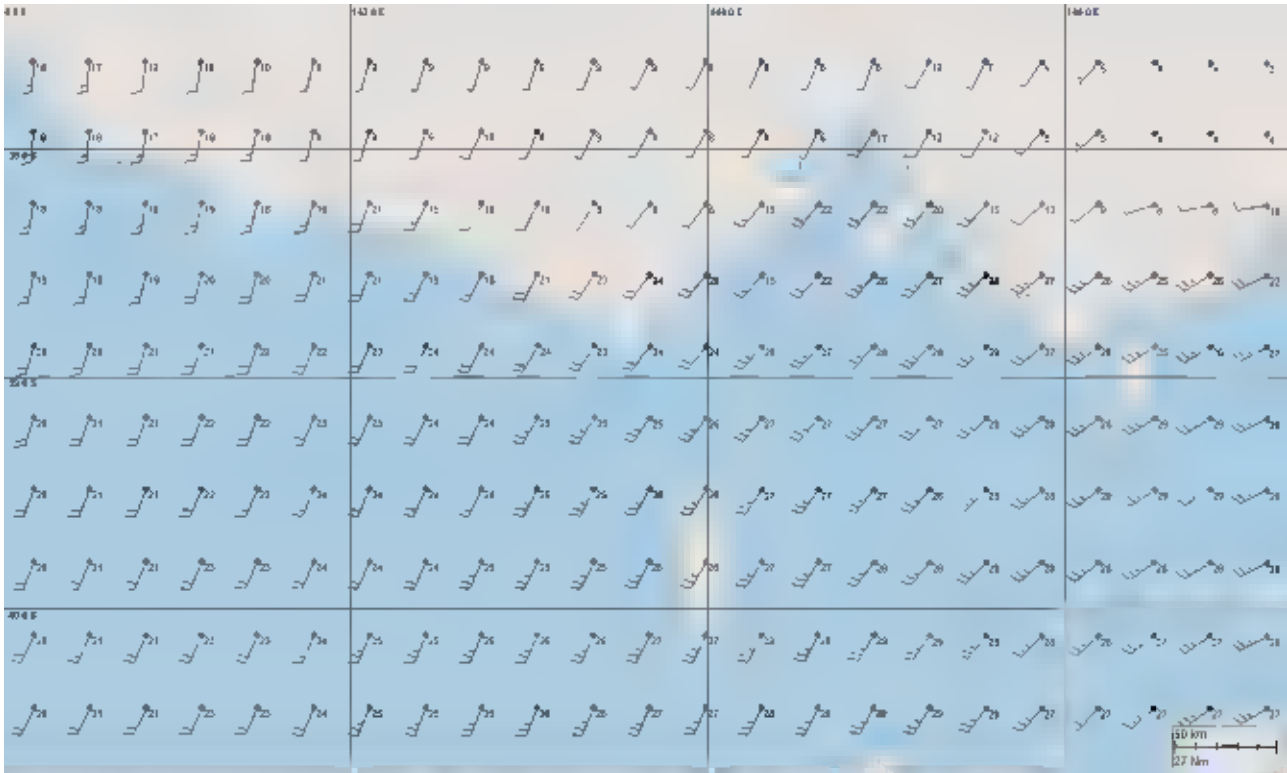


Figure 4.1 Spatial resolution of the CFSR modelled wind data used as input into the oil spill model.

Figure 4.2 to Figure 4.4 shows the monthly wind rose distributions derived from the CFSR nodes closest to the release locations while Figure 4.5 to Figure 4.7 illustrate the total current rose distribution.

Note that the atmospheric convention for defining wind direction, that is, the direction the wind blows from, is used to reference wind direction throughout this report. Each branch of the rose represents wind coming from that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent wind speed ranges from that direction. Speed ranges of 3 knots are predominantly used in these wind roses. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143 34°E, Latitude = 39 26°S
Analysis Period: 01-Jan-2019 to 31-Dec-2019

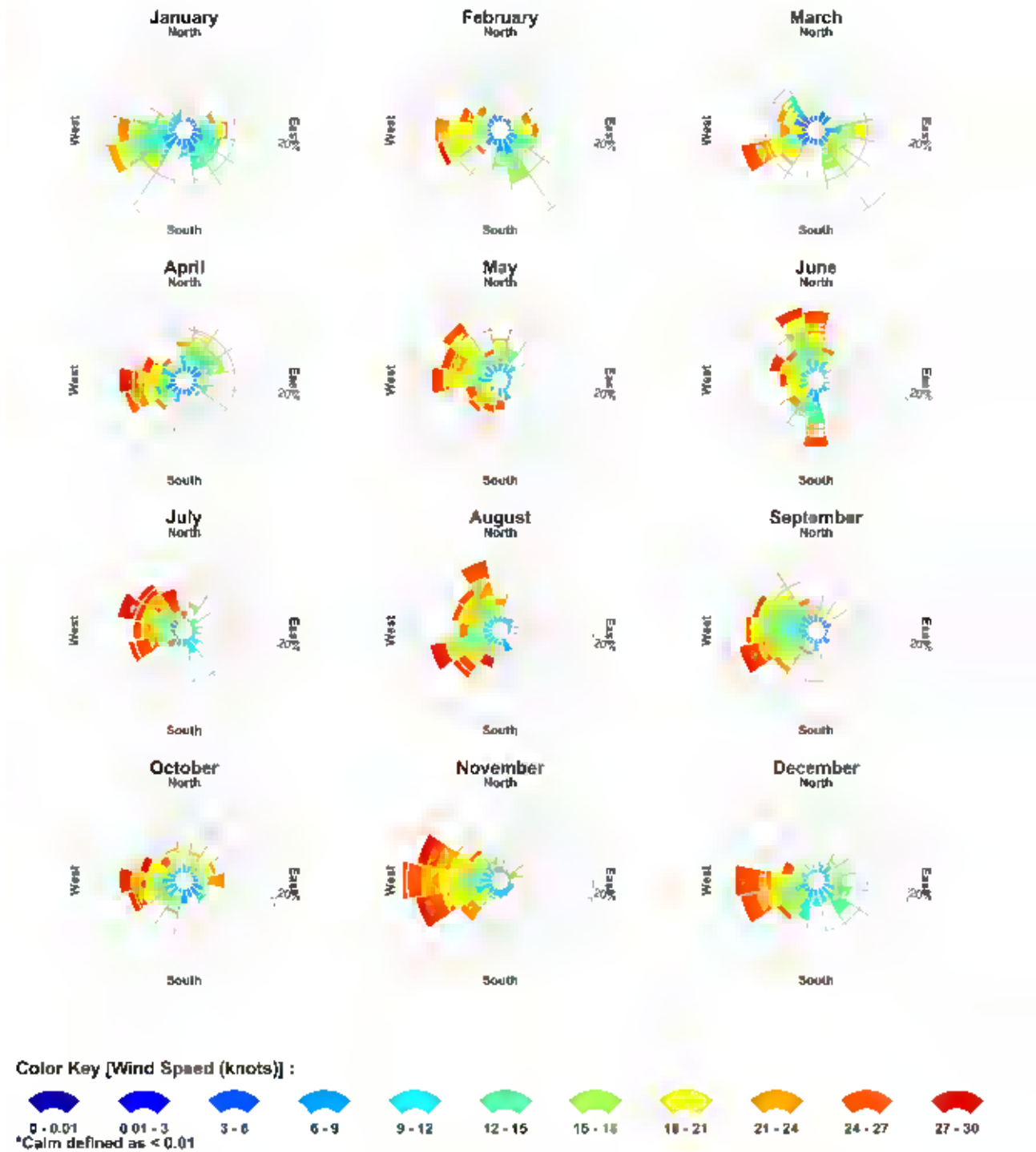


Figure 4.2 Monthly wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143 51°E, Latitude = 39 80°S
Analysis Period: 01-Jan-2019 to 31-Dec-2019

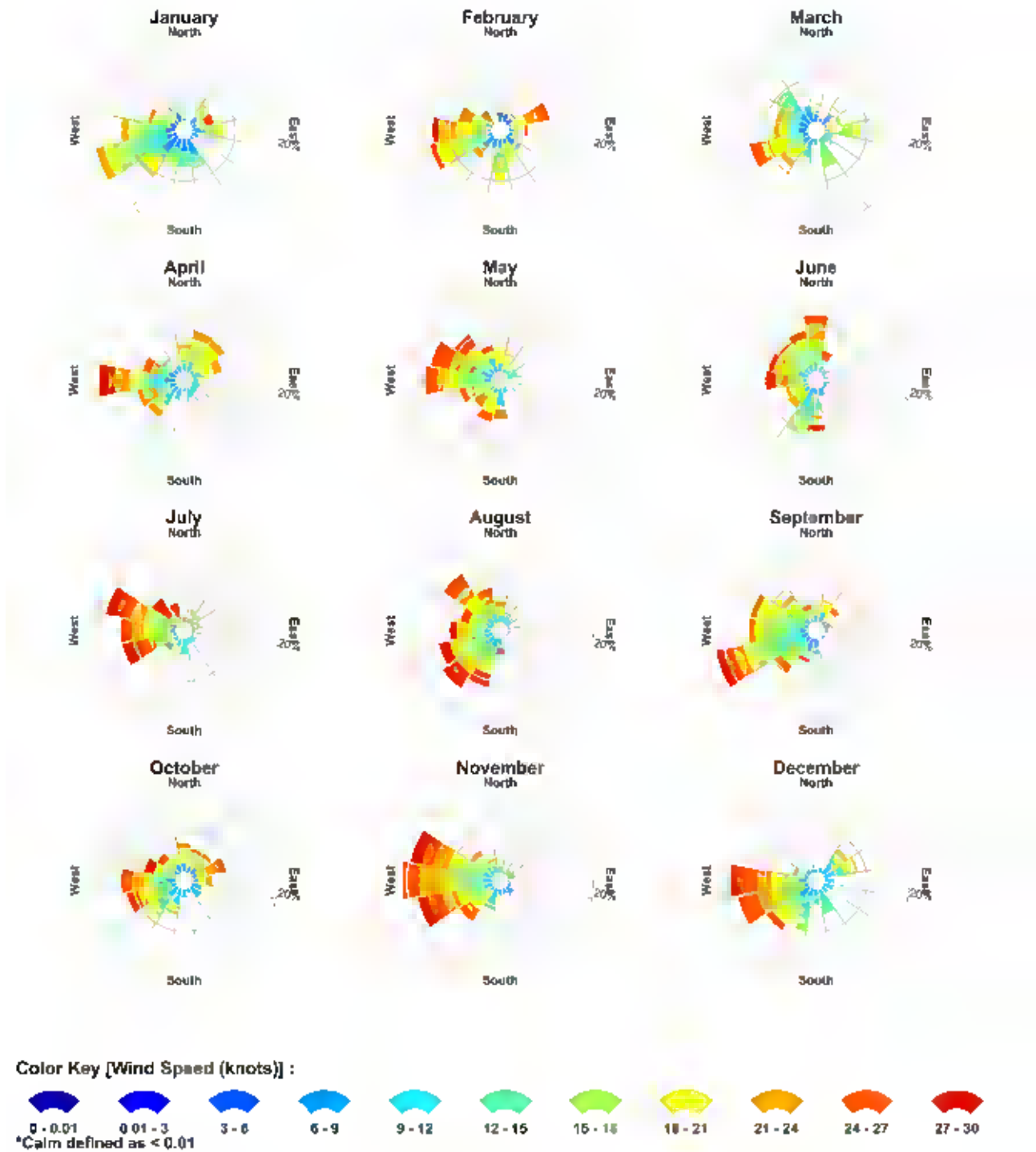


Figure 4.3 Monthly wind rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143 49°E, Latitude = 40 22°S
Analysis Period: 01-Jan-2019 to 31-Dec-2019

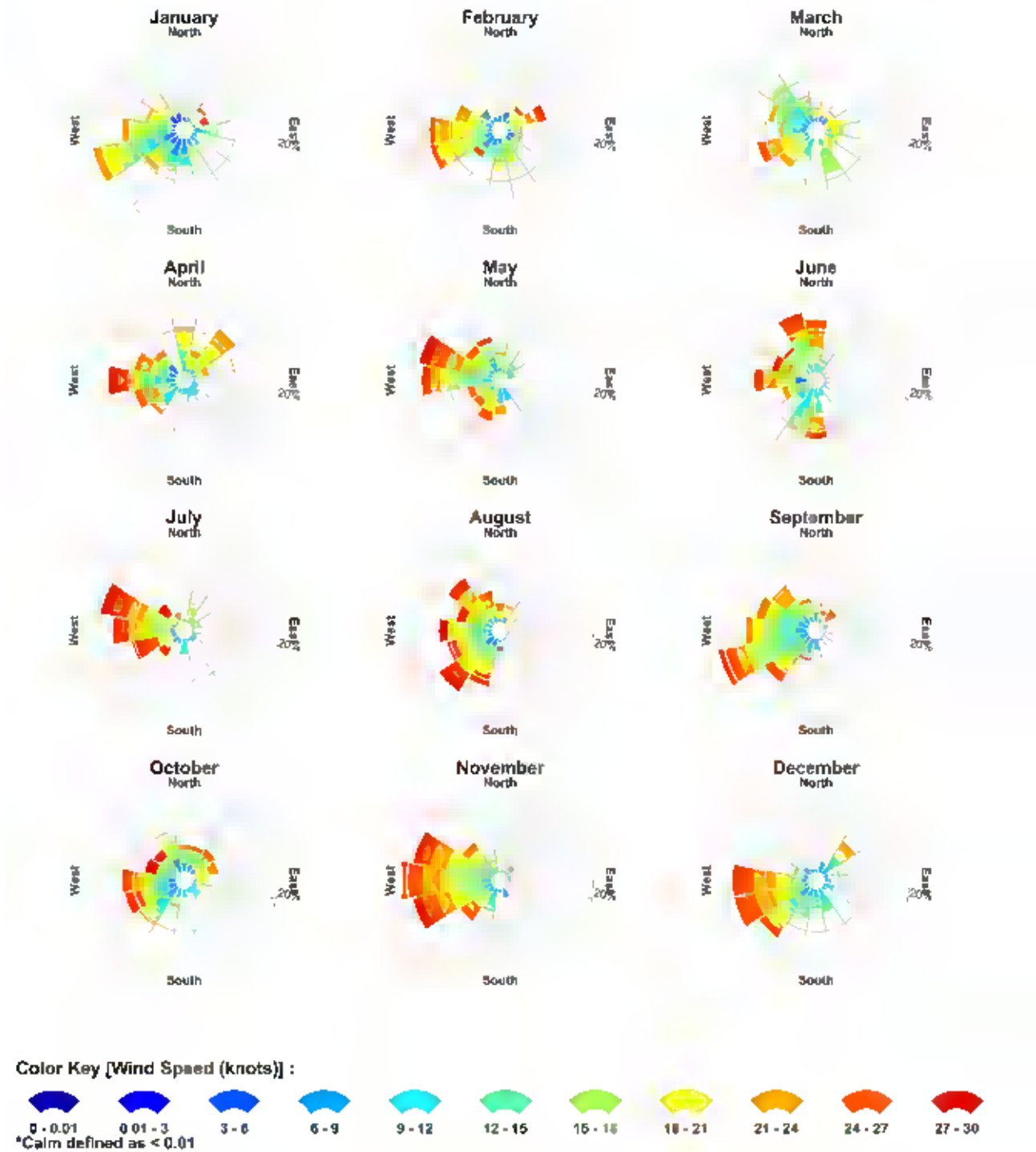


Figure 4.4 Monthly wind rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

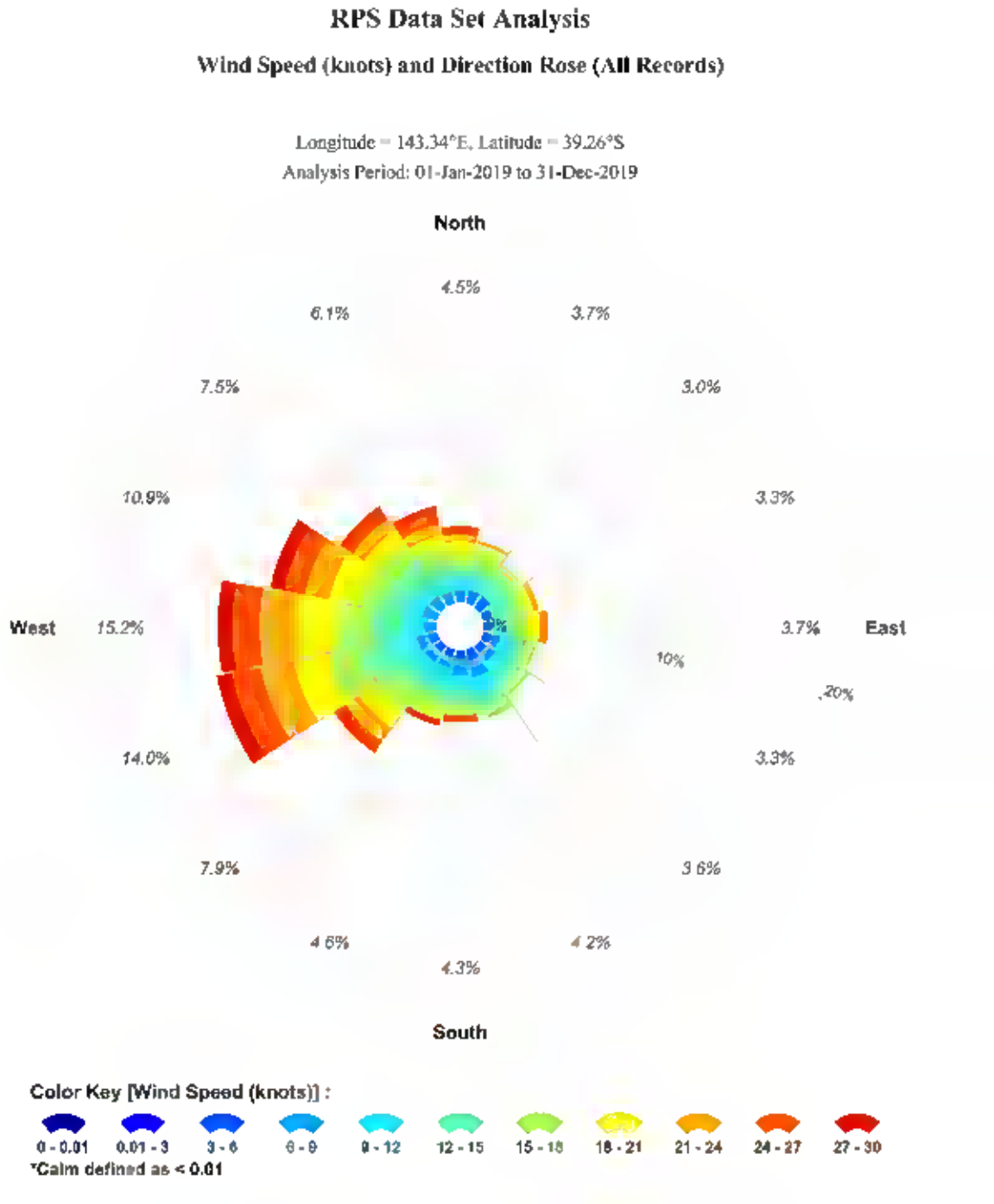


Figure 4.5 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.51°E, Latitude = 39.80°S
 Analysis Period: 01-Jan-2019 to 31-Dec-2019

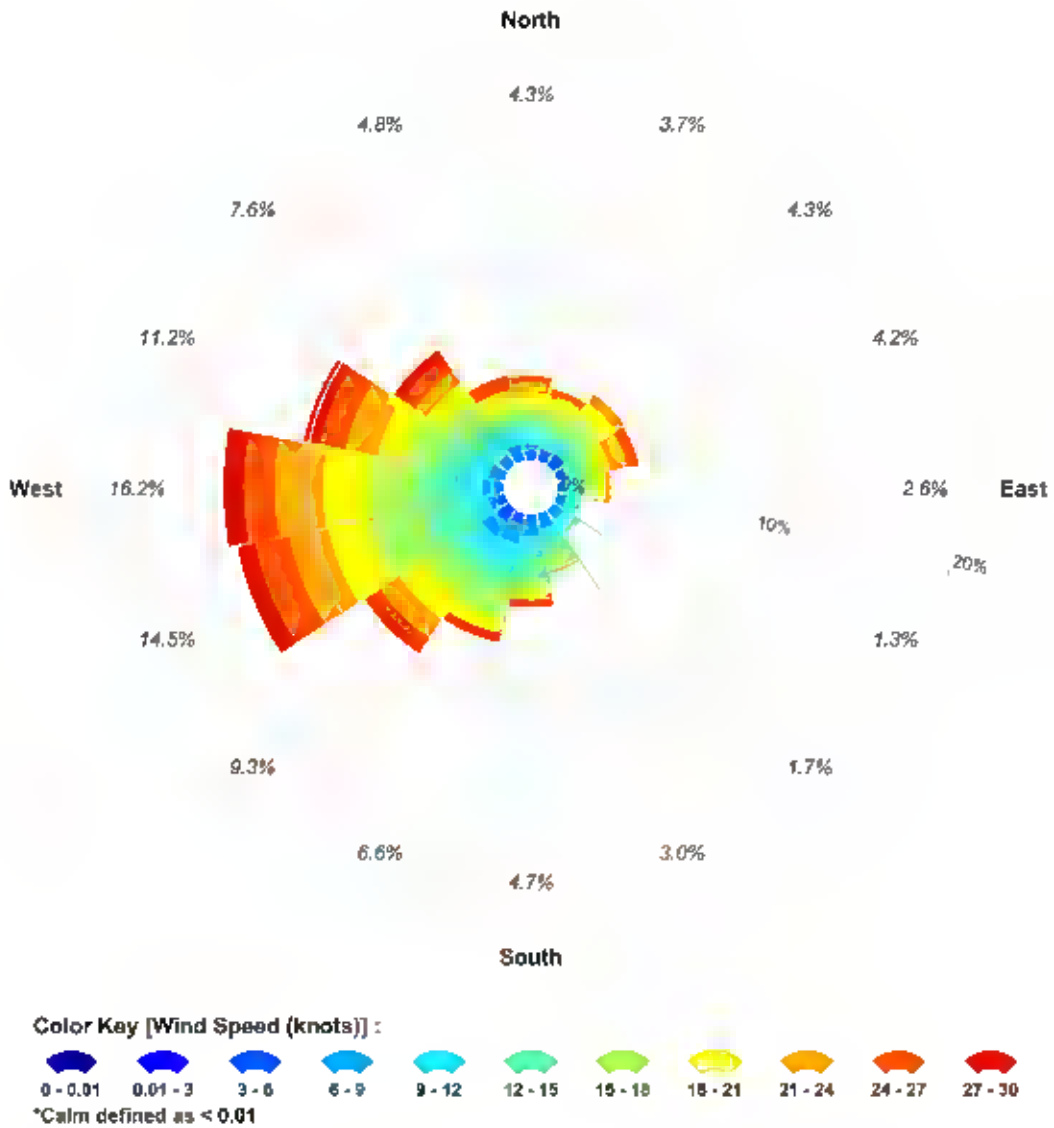


Figure 4.6 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 143.49°E, Latitude = 40.22°S
 Analysis Period: 01-Jan-2019 to 31-Dec-2019

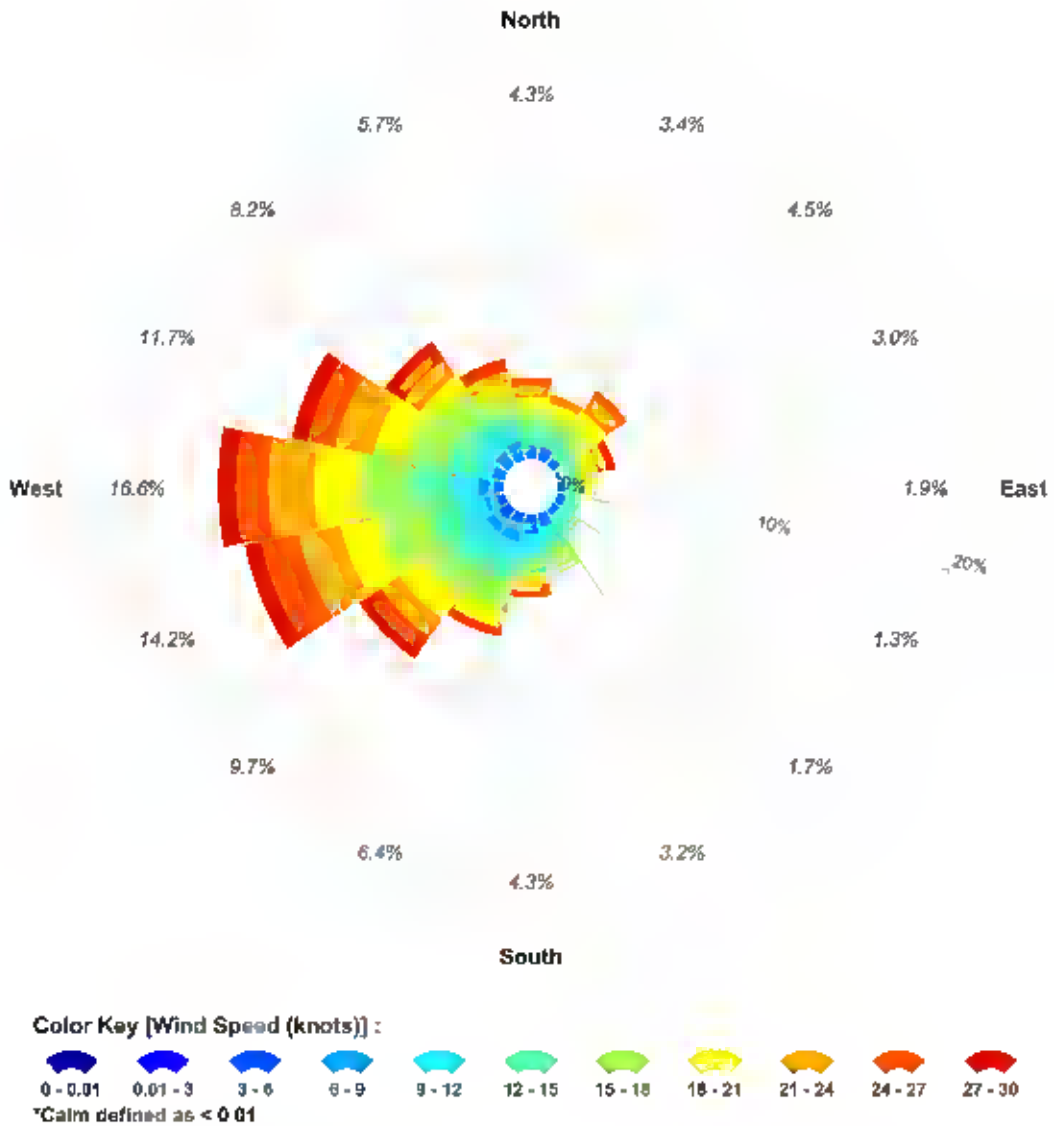


Figure 4.7 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

5 WATER TEMPERATURE AND SALINITY

Monthly water temperature and salinity data was obtained from the World Ocean Atlas 2013 database produced by the National Oceanographic Data Centre (National Oceanic and Atmospheric Administration) and its co-located World Data Center for Oceanography (Levitus et al. 2013). The data is used as input into oil spill model.

The monthly mean sea surface temperature and salinity values in the 0-5 m depth layer are presented in Table 5-1. The monthly average sea surface temperatures ranged between 12.8°C (September, release location 3) and 18.4°C (March, release location 2). The monthly average salinity values remain relatively consistent ranging between 35.1 psu and 35.6 psu.

Figure 5.1 shows the monthly water temperature and salinity profiles adjacent to the release locations.

Table 5-1 Monthly average sea surface temperature and salinity adjacent the release locations.

Release Location		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Temperature (°C)	17.6	17.4	18.1	16.5	15.8	15.1	14.8	13.4	13.0	14.4	14.3	15.7
	Salinity (psu)	35.3	35.1	35.5	35.3	35.3	35.2	35.6	35.3	35.4	35.4	35.4	35.4
2	Temperature (°C)	17.4	17.6	18.4	16.5	15.2	15.1	14.8	13.5	13.3	14.1	14.4	15.7
	Salinity (psu)	35.3	35.2	35.6	35.3	35.3	35.3	35.6	35.3	35.4	35.4	35.4	35.4
3	Temperature (°C)	16.5	17.0	17.6	15.8	14.4	14.0	14.1	13.0	12.8	13.3	13.9	15.3
	Salinity (psu)	35.2	35.1	35.4	35.2	35.2	35.2	35.4	35.2	35.3	35.3	35.3	35.3

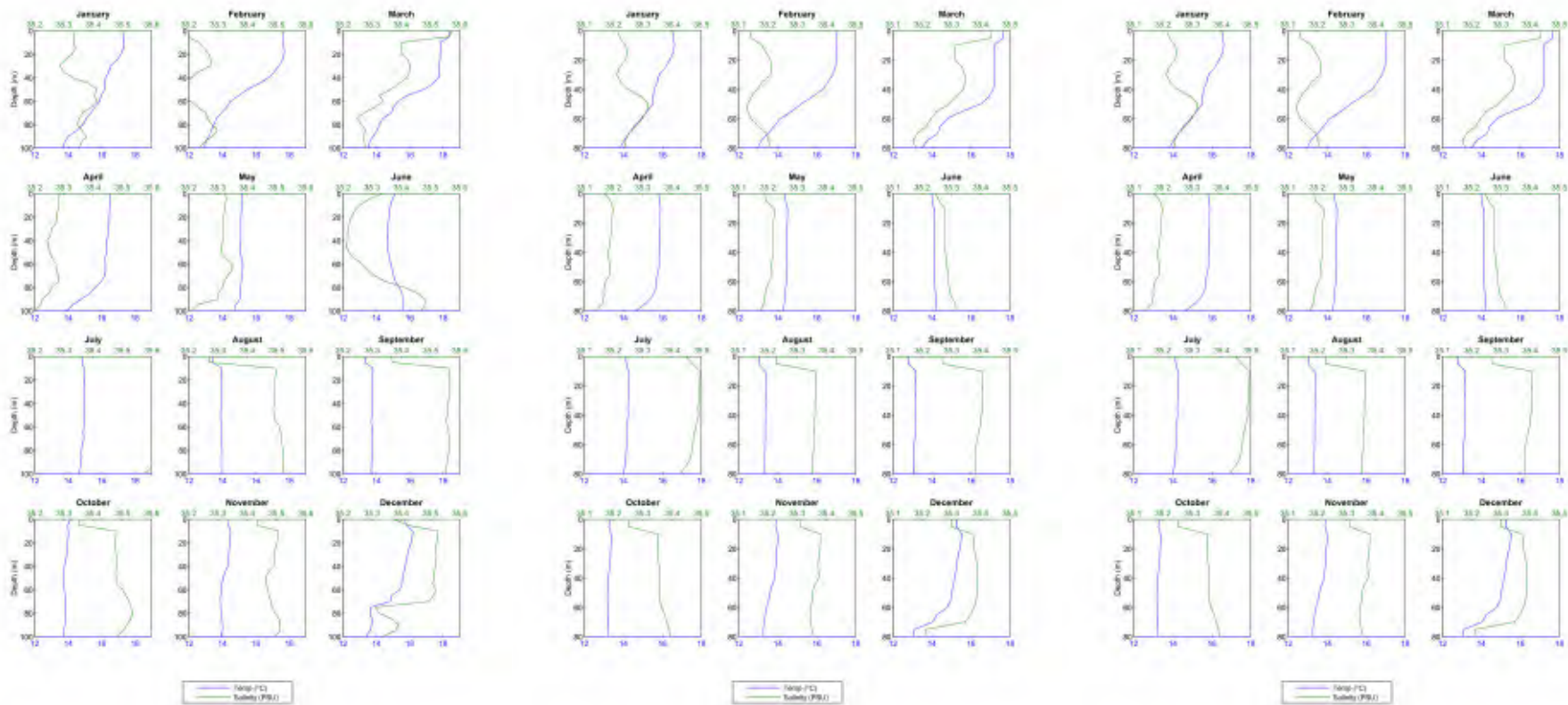


Figure 5.1 Monthly water temperature (blue line) and salinity (green line) profiles for Location 1 (left), Location 2 (middle) and Location 3 (right). Depth of 0 m is the water surface.

6 NEAR-FIELD MODEL – OILMAP DEEP

The LOWC scenario is a high-pressure release of mostly gas, condensate and small volume of condensed water. Where gas is released with condensate, the buoyancy of the expanding gas cloud will entrain ambient seawater and propel the droplets towards the surface at a faster rate than would occur from the relative buoyancy of the oil alone. Furthermore, The turbulence generated by such an intense discharge will tend to break the condensate up into droplets of various sizes.

To define the near-field plume dynamics, the subsea blowout model, OILMAP-DEEP, was applied. The model simulates the plume rise dynamics in two phases, the initial jet phase and the buoyant plume phase. The initial jet phase governs the plume dynamics directly above the subsurface release location and is predominately driven by the exit velocity. During this phase, the hydrocarbon droplet size and distribution is calculated. Next, the rise dynamics are dominated by the buoyant nature of the plume until the termination of the plume phase (known as the trapping depth). At this point, the results from OILMAP-DEEP (including plume trapping depth, plume diameter and droplet size distribution) are integrated into the far-field model SIMAP to simulate the rise and dispersion of the condensate droplets.

More details on the OILMAP-DEEP model, can be found in Spaulding et al. (2015). The model has been validated against observations from Deepwater Horizon as well as small and large-scale laboratory studies on subsurface oil releases (Brandvik et al., 2013, 2014; Belore, 2014; Spaulding et al., 2015; Li et al., 2017). Figure 6.1 illustrates the various stages of an example blowout plume.

Table 6-1 presents the input parameters for the OILMAP-DEEP model and key results related to the near-field plume dynamics. Inputs to the model included specification of the condensate density, viscosity and the discharge rate of the fluids: the diameter of the exit hole and the gas to oil ratio. The local temperature and salinity profiles of the water column were also specified to define the vertical density profile.

The subsea near-field modelling indicated that this pressurised discharge would cause the plume to breach the surface waters and the oil droplets would surface in less than a few minutes. The condensate droplets sizes were near identical at the three locations and range from 35 µm to 186 µm.

Table 6-1 Input data for the near field subsea modelling and key results for each location from the high-pressure LOWC release.

Input Variable	Location 1	Location 2	Location 3
Water depth (m)	93	100	114
Exit hole diameter (inch)		8.53	
Condensate release rate (m ³ /day)		1,549	
Gas to condensate ratio (scf/bbl)		50,000	
Formation water flow rate (stb/day)		974	
Reservoir Temperature (°C)		130	
Well pressure at seafloor (psia)	136	146	166
Key results			
Plume execution depth (m BMSL)	0 (breach surface waters)		
Droplet sizes (µm)	35 - 153	38 - 164	43 - 186
Final plume diameter (m)	12.0	12.9	14.7

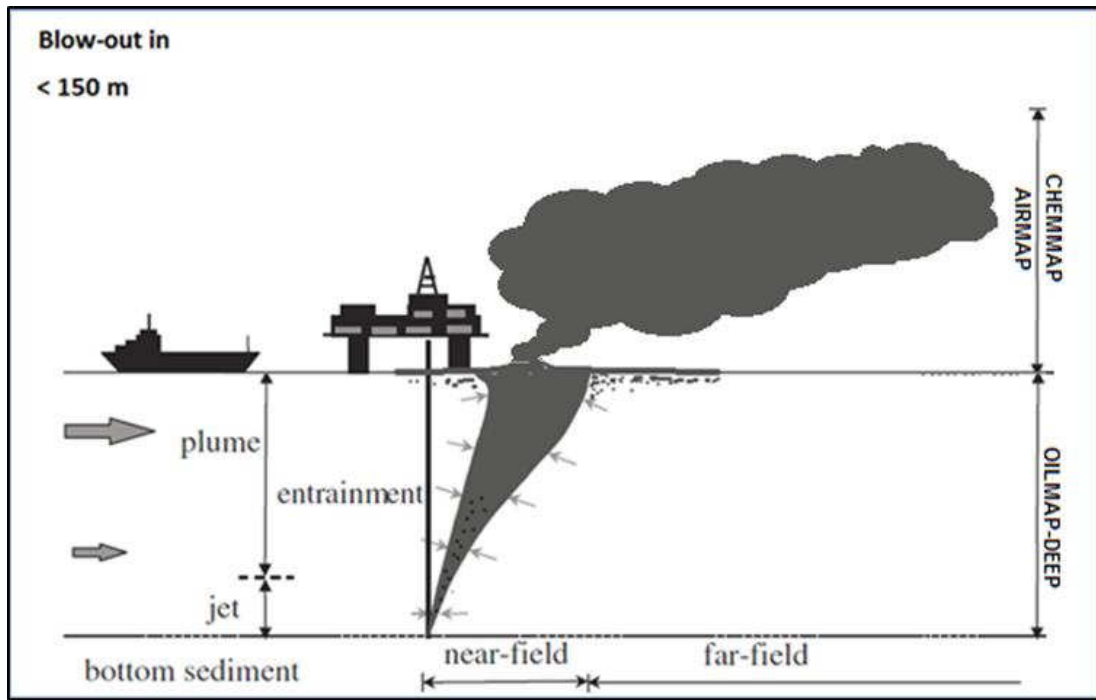


Figure 6.1 Example of a blowout plume illustrating the various stages of the plume in the water column (Source: Applied Science Associates, 2011).

7 OIL SPILL MODEL - SIMAP

The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP (Spill Impact Mapping and Assessment Program). This model is designed to simulate the transport and weathering processes that affect the outcomes of hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns.

SIMAP is the evolution of the United States Environmental Protection Agency (US EPA) Natural Resource Damage Assessment model (French & Rines, 1997; French et al., 1999) and is designed to simulate the fate and effects of spilled oils and fuels for both the surface slick and the three-dimensional plume that is generated in the water column. SIMAP includes algorithms to account for both physical transport and weathering processes. The latter are important for accounting for the partitioning of the spilled mass over time between the water surface (surface slick), water column (entrained oil and dissolved compounds), atmosphere (evaporated compounds) and land (stranded oil). The model also accounts for the interaction between weathering and transport processes.

The physical algorithms calculate transport and spreading by physical forces, including surface tension, gravity and wind and current forces for both surface slicks and oil within the water column. The fates algorithms calculate all the weathering processes known to be important for oil spilled to marine waters. These include droplet and slick formation, entrainment by wave action, emulsification, dissolution of soluble components, sedimentation, evaporation, bacterial and photo-chemical decay and shoreline interactions. These algorithms account for the specific oil type being considered.

Entrainment is the physical process where globules of oil are transported from the sea surface into the water column by wind and wave-induced turbulence or be generated subsea by a pressurised discharge at depth. It has been observed that entrained oil is broken into droplets of varying sizes. Small droplets spread and diffuse into the water column, while larger ones rise rapidly back to the surface (Delvigne & Sweeney, 1988; Delvigne, 1991).

Dissolution is the process by which soluble hydrocarbons enter the water from a surface slick or from entrained droplets. The lower molecular weight hydrocarbons tend to be both more volatile and more soluble than those of higher molecular weight.

The formation of water-in-oil emulsions, or mousse, which is termed 'emulsification', depends on oil composition and sea state. Emulsified oil can contain as much as 80% water in the form of micrometre-sized droplets dispersed within a continuous phase of oil (Daling & Brandvik, 1991; Bobra, 1991; Daling et al., 1997; Fingas, 1995).

Evaporation can result in the transfer of large proportions of spilled oil from the sea surface to the atmosphere, depending on the type of oil (Gundlach & Boehm, 1981).

Evaporation rates vary over space and time dependent on the prevailing sea temperatures, wind and current speeds, the surface area of the slick and entrained droplets that are exposed to the atmosphere as well as the state of weathering of the oil. Evaporation rates will decrease over time, depending on the calculated rate of loss of the more volatile compounds. By this process, the model can differentiate between the fates of different oil types.

Decay (degradation) of hydrocarbons may occur as the result of photolysis, which is a chemical process energised by ultraviolet light from the sun, and by biological breakdown, termed biodegradation. Many types of marine organisms ingest, metabolise and utilise oil as a carbon source, producing carbon dioxide and water as by-products.

Entrainment, dissolution and emulsification rates are correlated to wave energy, which is accounted for by estimating wave heights from the sustained wind speed, direction and fetch (i.e. distance downwind from land barriers) at different locations in the domain. Dissolution rates are dependent upon the proportion of soluble, short-chained hydrocarbon compounds, and the surface area at the oil/water interface of slicks. Dissolution rates are also strongly affected by the level of turbulence. For example, dissolution rates will be relatively high at the site of the release for a deep-sea discharge at high pressure.

The SIMAP weathering algorithms include terms to represent these dynamic processes. Technical descriptions of the algorithms used in SIMAP and validations against real spill events are provided in French (1998), French et al. (1999) and French-McCay (2004).

Input specifications for oil types include density, viscosity, pour-point, distillation curve (volume of oil distilled off versus temperature) and the aromatic/aliphatic component ratios within given boiling point ranges. The model calculates a distribution of the oil by mass into the following components:

- Surface-bound or floating oil;
- Entrained oil (non-dissolved oil droplets that are physically entrained by wave action);
- Dissolved hydrocarbons (principally the aromatic and short-chained aliphatic compounds);
- Evaporated hydrocarbons;
- Sedimented hydrocarbons; and
- Decayed hydrocarbons.

8 CONDENSATE PROPERTIES

The characteristics for Thylacine condensate were based on a detailed assay, which was used as a proxy. Table 8-1 and Table 8-2 summarise the physical properties and boiling point ranges, respectively. Thylacine condensate has an API of 44.3, a density of 805 kg/m³ (at 15°C) and a low viscosity value of 0.875 cP.

The volatile to semi-volatile components (boiling point (BP) < 265 °C), which represent approximately 83% of the whole condensate is likely to evaporate over the first day if exposed to the atmosphere at local temperatures, leaving the less volatile portion (16%) to progressively evaporate more slowly. Only 1% of the condensate is considered persistent.

Thylacine condensate is categorised as a group I oil (non – persistent oil) according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges.

The heavier components (i.e low volatile portion) of the condensate will tend to entrain into the upper water column during the presence of moderate winds (> 10 knots) and can potentially remain entrained for as long as the winds persist. But can subsequently resurface when the winds ease, and waves abate.

Table 8-1 Physical properties for Thylacine condensate.

Characteristic	Thylacine condensate
Density (kg/m ³)	805 (at 15°C)
API	44.3
Dynamic viscosity (cP)	9.95 (at 50°C)
Hydrocarbon property category	Group I
Hydrocarbon property classification	Non-persistent oil

Table 8-2 Boiling point ranges for Thylacine condensate.

Characteristics	Non-Persistent			Persistent
	Volatile (%)	Semi-volatile (%)	Low-volatility (%)	Residual (%)
Boiling point (°C)	<180	180-265	265-380	>380
Thylacine condensate	64.0	19.0	16.0	1.0

9 THRESHOLDS

The thresholds and their relationship to exposure for the sea surface, shoreline, and water column (entrained and dissolved hydrocarbons) are presented in Sections 9.1 to 9.3. Supporting justifications of the adopted thresholds applied during the study and additional context relating to the area of influence are also provided. It is important to note that the thresholds herein are based on NOPSEMA (2019).

9.1 Floating Exposure Thresholds

The modelling results can be presented to any levels; therefore, thresholds have been specified (based on scientific literature) to record floating oil exposure to the sea-surface at meaningful levels only, described in the following paragraphs.

The low threshold to assess the potential for floating oil exposure, was 1 g/m², which equates approximately to an average thickness of 1 µm, referred to as visible oil. Oil of this thickness is described as rainbow sheen in appearance, according to the Bonn Agreement Oil Appearance Code (Bonn Agreement, 2009; AMSA, 2014). Table 9-1 provides a description of the appearance in relation to exposure zone thresholds used to classify the zones of floating oil exposure. Figure 9.1 shows photographs highlighting the difference in appearance between a rainbow sheen and metallic sheen. The low threshold is considered below levels which would cause environmental harm and it is more indicative of the areas perceived to be affected due to its visibility on the sea surface and potential to trigger temporary closures of areas (i.e., fishing grounds) as a precautionary measure.

Ecological impact has been estimated to occur at 10 g/m², which equates to a film thickness of approximately 10 µm or 0.01 mm (French et al. 1996; French-McCay 2009) as this level of fresh oiling has been observed to mortally impact some birds through adhesion of oil to their feathers, exposing them to secondary effects such as hypothermia. The appearance of oil at this average thickness has been described as a metallic sheen (Bonn Agreement, 2009). Concentrations above 10 g/m² is also considered the lower actionable threshold, where oil may be thick enough for containment and recovery as well as dispersant treatment (AMSA, 2015).

Oil concentrations on the sea surface of 25 g/m² (or greater), would be harmful for all birds that have landed in an oil film due to potential contamination of their feathers, with secondary effects such as loss of temperature regulation and ingestion of oil through preening (Scholten et al., 1996; Koops et al., 2004). The appearance of oil at this thickness is also described as metallic sheen (Bonn Agreement, 2009). For this study the high exposure threshold was set to 50 g/m² and above based on NOPSEMA (2019). This threshold can also be used to inform response planning.

Table 9-2 defines the thresholds used to classify the zones of floating oil exposure reported herein.

Table 9-1 The Bonn Agreement Oil Appearance Code.

Code	Description Appearance	Layer Thickness Interval (g/m ² or µm)	Litres per km ²
1	Sheen (silvery/grey)	0.04 – 0.30	40 – 300
2	Rainbow	0.30 – 5.0	300 – 5,000
3	Metallic	5.0 – 50	5,000 – 50,000
4	Discontinuous True Oil Colour	50 – 200	50,000 – 200,000
5	Continuous True Oil Colour	≥ 200	≥ 200,000

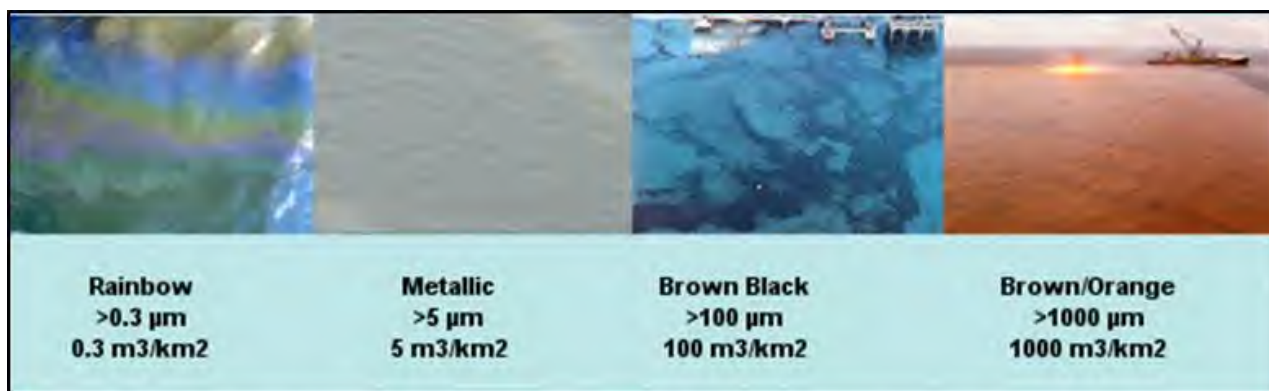


Figure 9.1 Photographs showing the difference between oil colour and thickness on the sea surface (source: adapted from Oil Spill Solutions, 2015).

Table 9-2 Floating oil exposure thresholds used in this report (in alignment with NOPSEMA (2019)).

Threshold level	Floating oil (g/m ²)	Description
Low	1	Approximates range of socio-economic effects and establishes planning area for scientific monitoring
Moderate	10	Approximates lower limit for harmful exposures to birds and marine mammals
High	50*	Approximates surface oil slick and informs response planning

* 50 g/m² also used to define the threshold for actionable floating oil.

9.2 Shoreline Accumulation Thresholds

There are many different types of shorelines, ranging from cliffs, rocky beaches, sandy beaches, mud flats and mangroves, and each of these influences the volume of oil that can remain stranded ashore and its thickness before the shoreline saturation point occurs. For instance, a sandy beach may allow oil to percolate through the sand, thus increasing its ability to hold more oil ashore over tidal cycles and various wave actions than an equivalent area of water; hence oil can increase in thickness onshore over time. A sandy beach shoreline was assumed as the default shoreline type for the modelling in this study, as it allows for the highest carrying capacity of oil (of the available open/exposed shoreline types). Hence the results are considered conservative (i.e., worst-case) given that a large part of the shoreline in the study area (especially the western part of the Joseph Bonaparte Gulf) is characterised by exposed rocky shorelines, with southern parts characterised by tidal mudflats and mangroves and eastern shorelines containing more sandy beaches.

Previous risk assessment studies, French-McCay et al. (2005a; 2005b) used a threshold of 10 g/m² to assess the potential for shoreline accumulation. This is a conservative threshold used to define regions of socio-economic impact, such as triggering temporary closures of adjoining fisheries or the need for shore clean-up on beaches or man-made features/amenities (breakwaters, jetties, marinas, etc.). It would equate to approximately 2 teaspoons of hydrocarbon per square meter of shoreline accumulation. The appearance is described as a stain/film. On that basis, the 10 g/m² shoreline accumulation threshold has been selected to define the zone of potential “low shoreline accumulation”.

French et al. (1996) and French-McCay (2009) define a shoreline oil accumulation threshold of 100 g/m², or above, would potentially harm shorebirds and wildlife (fur-bearing aquatic mammals and marine reptiles on or along the shore) based on studies for sub-lethal and lethal impacts. This threshold has been used in previous environmental risk assessment studies (see French-McCay, 2003; French-McCay et al., 2004, French-McCay et al., 2011; 2012; NOAA, 2013). Additionally, a shoreline concentration of 100 g/m², or above, is the minimum concentration that the oil can be effectively cleaned according to AMSA (2015). This threshold equates to approximately ½ a cup of oil per square meter of shoreline accumulation. The

appearance is described as a thin oil coat. Therefore, 100 g/m² has been selected to define the zone of potential “moderate shoreline accumulation”.

Observations by Lin & Mendelsohn (1996) demonstrated that loadings of more than 1,000 g/m² of hydrocarbon during the growing season would be required to impact marsh plants significantly. Similar thresholds have been found in studies assessing hydrocarbon impacts on mangroves (Grant et al., 1993; Suprayogi & Murray, 1999). This loading equates to approximately 1 litre of hydrocarbon per square meter of shoreline accumulation and the appearance is described as a hydrocarbon cover. A loading of 1,000 g/m² has been selected to define the zone of potential “high shoreline accumulation”.

These shoreline accumulation thresholds derived from extensive literature review (outlined in Table 9-3) align with the threshold values for oil spill modelling specified in NOPSEMA (2019).

Table 9-3 Thresholds used to assess shoreline accumulation.

Threshold level	Shoreline loading (g/m ²)	Description
Low (socioeconomic/sublethal)	10	Predicts potential for some socio-economic impact
Moderate	100*	Loading predicts area likely to require clean-up effort
High	1,000	Loading predicts area likely to require intensive clean-up effort

* 100 g/m² also used to define the threshold for actionable shoreline oil.

9.3 In-water Exposure Thresholds

Oil is a mixture of thousands of hydrocarbons of varying physical, chemical, and toxicological characteristics, and therefore, demonstrate varying fates and impacts on organisms. As such, for in-water exposure, the SIMAP model provides separate outputs for dissolved and entrained hydrocarbons from oil droplets. The consequences of exposure to dissolved and entrained components will differ because they have different modes and magnitudes of effect.

Entrained hydrocarbon concentrations were calculated based on oil droplets that are suspended in the water column, though not dissolved. The composition of this oil would vary with the state of weathering (oil age) and may contain soluble hydrocarbons when the oil is fresh. Calculations for dissolved hydrocarbons specifically calculates oil components which are dissolved in water, which are known to be the primary source of toxicity exerted by oil.

A complicating factor that should be considered when assessing the consequence of dissolved and entrained oil distributions is that there will be some areas where both physically entrained oil droplets and dissolved hydrocarbons co-exist. Higher concentrations of each will tend to occur close to the source where sea conditions can force mixing of relatively unweathered oil into the water column, resulting in more rapid dissolution of soluble compounds.

9.3.1 Dissolved Hydrocarbons

Laboratory studies have shown that dissolved hydrocarbons exert most of the toxic effects of oil on aquatic biota (Carls et al., 2008; Nordtug et al., 2011; Redman, 2015). The mode of action is a narcotic effect, which is positively related to the concentration of soluble hydrocarbons in the body tissues of organisms (French-McCay, 2002). Dissolved hydrocarbons are taken up by organisms directly from the water column by absorption through external surfaces and gills, as well as through the digestive tract. Thus, soluble hydrocarbons are termed “bioavailable”.

Hydrocarbon compounds vary in water-solubility and the toxicity exerted by individual compounds is inversely related to solubility, however bioavailability will be modified by the volatility of individual compounds (Nirmalakhandan & Speece, 1988; Blum & Speece, 1990; McCarty, 1986; McCarty et al., 1992a, 1992b;

McCarty & Mackay, 1993; Verhaar et al., 1992, 1999; Swartz et al., 1995; French-McCay, 2002; McGrath and Di Toro, 2009). Of the soluble compounds, the greatest contributor to toxicity for water-column and benthic organisms are the lower-molecular-weight aromatic compounds, which are both volatile and soluble in water. Although they are not the most water-soluble hydrocarbons within most oil types, the polynuclear aromatic hydrocarbons (PAHs) containing 2-3 aromatic ring structures typically exert the largest narcotic effects because they are semi-soluble and not highly volatile, so they persist in the environment long enough for significant accumulation to occur (Anderson et al., 1974, 1987; Neff & Anderson, 1981; Malins & Hodgins, 1981; McAuliffe, 1987; NRC, 2003). The monoaromatic hydrocarbons (MAHs), including the BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), and the soluble alkanes (straight chain hydrocarbons) also contribute to toxicity, but these compounds are highly volatile, so that their contribution will be low when oil is exposed to evaporation and higher when oil is discharged at depth where volatilisation does not occur (French-McCay, 2002).

French-McCay (2002) reviewed available toxicity data, where marine biota was exposed to dissolved hydrocarbons prepared from oil mixtures, finding that 95% of species and life stages exhibited 50% population mortality (LC₅₀) between 6 and 400 ppb total PAH concentration after 96 hrs exposure, with an average of 50 ppb. Hence, concentrations lower than 6 ppb total PAH value should be protective of 97.5% of species and life stages even with exposure periods of days (at least 96 hours). Early life-history stages of fish appear to be more sensitive than older fish stages and invertebrates.

Exceedances of 10, 50 or 400 ppb over a 1 hour timestep (see Table 9-4) were applied in this study to indicate the increasing potential for sub-lethal to lethal toxic effects (or low to high), based on NOPSEMA (2019).

9.3.2 Entrained Hydrocarbons

Entrained hydrocarbons consist of oil droplets that are suspended in the water column and insoluble. Insoluble compounds in oil cannot be absorbed from the water column by aquatic organisms, therefore they are not bioavailable through absorption of compounds from the water. Exposure to these compounds would require routes of uptake other than absorption of soluble compounds. The route of exposure of organisms to whole oil alone include direct contact with tissues of organisms and uptake of oil by direct consumption, with potential for biomagnification through the food chain (NRC, 2003).

The 10 ppb threshold corresponds generally with the lowest trigger levels for chronic exposure for entrained hydrocarbons in the ANZECC & ARMCANZ (2000) water quality guidelines. Due to the requirement for relatively long exposure times (> 24 hours) for these concentrations to accumulate, they are likely to be more meaningful for juvenile fish, larvae and planktonic organisms that might be entrained (or otherwise moving) within the entrained plumes, or when entrained hydrocarbons adhere to organisms or are trapped against a shoreline for periods of several days or more.

This exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill. This area does not define the area of influence as it is considered that the environment will not be affected by the entrained hydrocarbon at this level.

Thresholds of 10 ppb and 100 ppb were applied over a 1 hour time exposure (Table 9-4), to cover the range of thresholds outlined in ANZECC & ARMCANZ (2000) water quality guidelines and is per NOPSEMA (2019).

Table 9-4 Dissolved and entrained hydrocarbon exposure values assessed over a 1-hour time step, as per NOPSEMA (2019).

	Exposure level	In-water threshold (ppb)	Description
Dissolved hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	Moderate	50	Approximates potential toxic effects, particularly sublethal effects to sensitive species
	High	400	Approximates toxic effects including lethal effects to sensitive species
Entrained hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	High	100	As appropriate given oil characteristics for informing risk evaluation

9.4 Dispersion

A horizontal dispersion coefficient of 10 m²/s was used to account for dispersive processes acting at the surface that are below the scale of resolution of the input current field, based on typical values for open waters (Okubo, 1971). Dispersion rates within the water column (applicable for entrained and dissolved plumes of hydrocarbons) were specified at 1 m²/s, based on empirical data for the dispersion of hydrocarbon plumes (King & McAllister, 1998).

10 RECEPTORS

A range of environmental receptors and shorelines were assessed for floating oil exposure, shoreline contact and water column exposure (entrained and dissolved hydrocarbons) as part of the study (see Figure 10.1 to Figure 10.12). Receptor categories are shown in Table 10-1 which includes coastal and offshore islands grouped as shorelines. All other sensitive receptors other than submerged reefs, shoals and banks (RSB) were sourced from Australian Government Department of Agriculture, Water and the Environment (<http://www.environment.gov.au/>). Probabilities of exposure were separately calculated for each sensitive receptor area and have been tabulated.

Table 10-1 Summary of receptors assessed for potential oil exposure.

Receptor Category	Acronym	Hydrocarbon Exposure and Accumulation Assessment		
		Floating oil	Water Column	Shoreline
Australian Marine Park	AMP	✓	✓	✗
Biologically Important Area	BIA	✓	✓	✗
Conservation Park	CP	✓	✓	✗
Interim Biogeographic Regionalisation for Australia bioregions	IBRA	✓	✓	✗
Integrated marine and coastal regionalisation areas	IMCRA	✓	✓	✗
Marine National Park	MNP	✓	✓	✗
Marine Park	MP	✓	✓	✗
Marine Sanctuary	MS	✓	✓	✗
National Park	NP	✓	✓	✗
National Parks Act Schedule 4 park or reserve	NPS4	✓	✓	✗
Nature Reserve	NR	✓	✓	✗
Ramsar Sites	Ramsar	✓	✓	✗
Reefs, Shoals and Banks	RSB	✓	✓	✗
Key Ecological Feature	KEF	✓	✓	✗
State Waters	State Waters	✓	✓	✗
Shorelines	Shore	✓ (Reported as: Nearshore Waters)	✓ (Reported as: Nearshore Waters)	✓

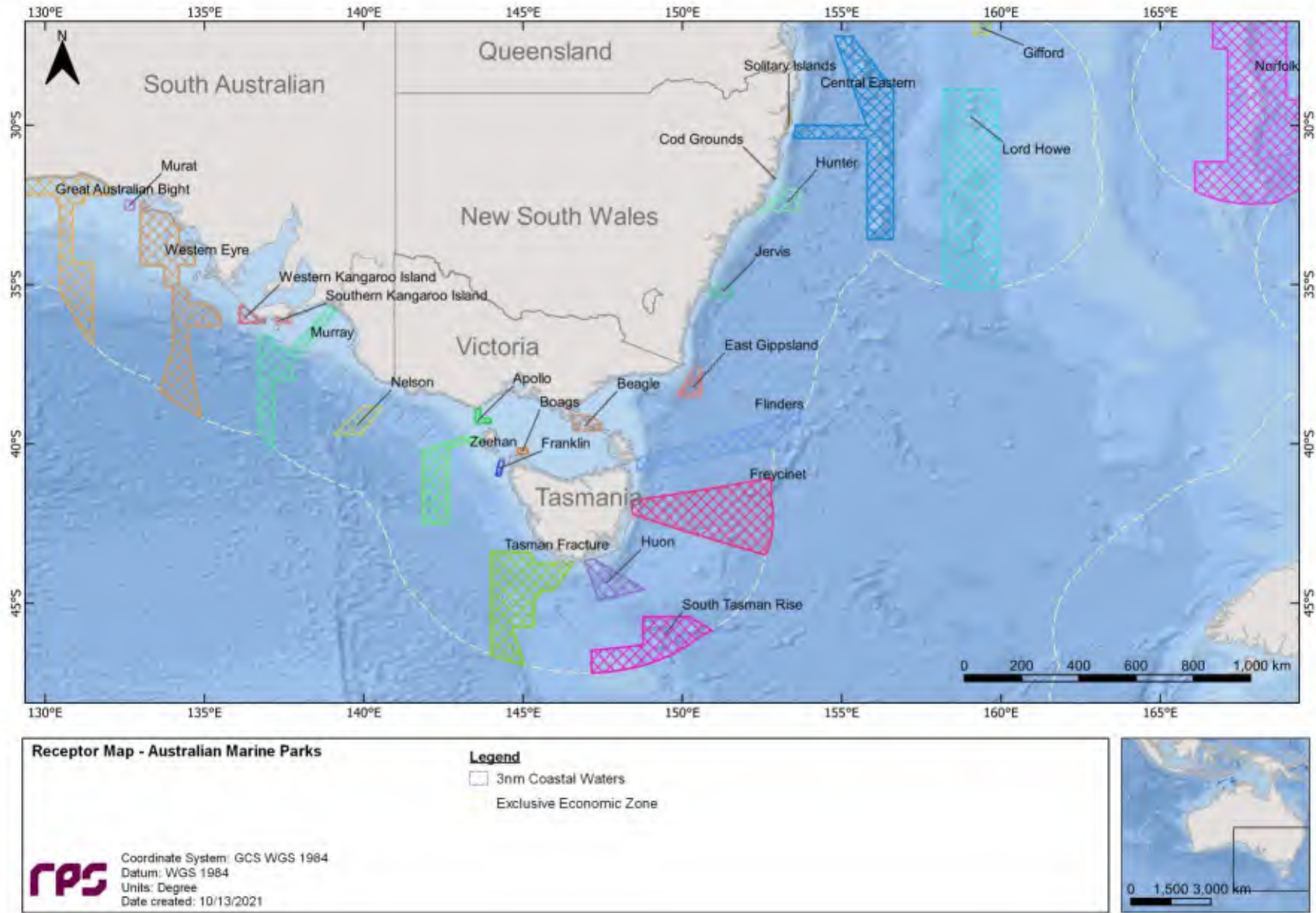


Figure 10.1 Receptor map for Australian Marine Parks (AMP).

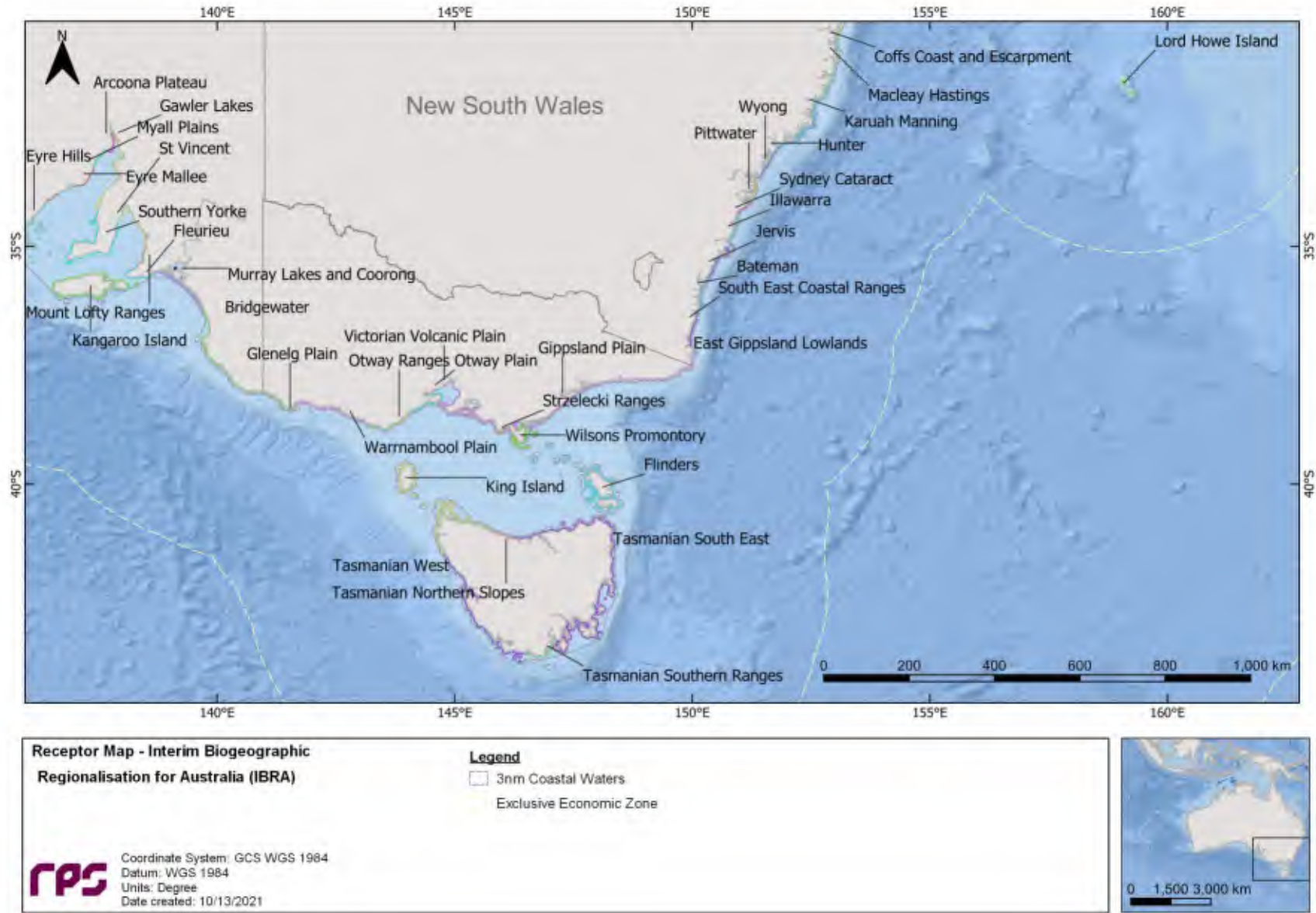


Figure 10.2 Receptor map for the Interim Biogeographic Regionalisation for Australia (IBRA) bioregions.

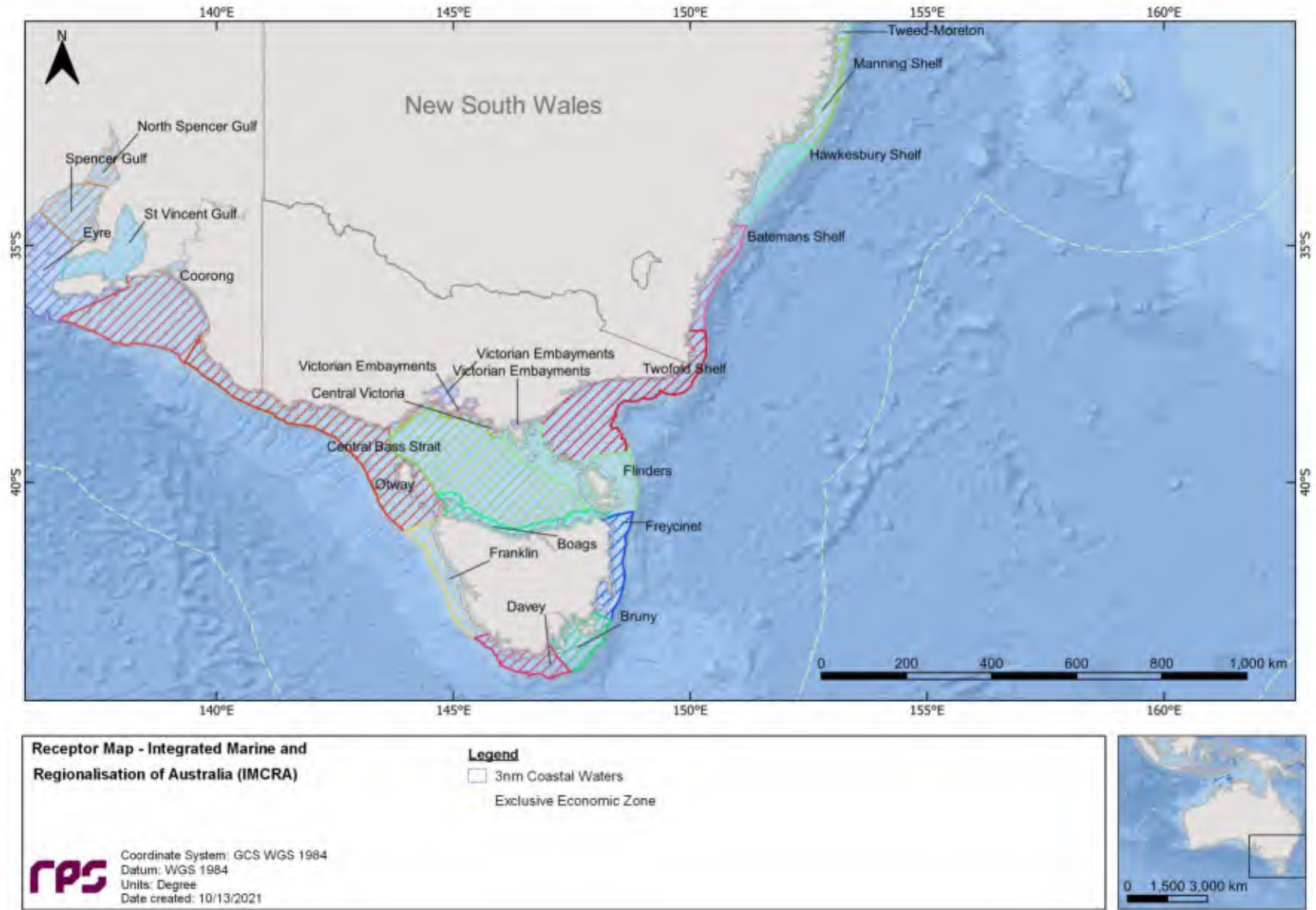


Figure 10.3 Receptor map for integrated marine and coastal regionalisation (IMCRA) areas.

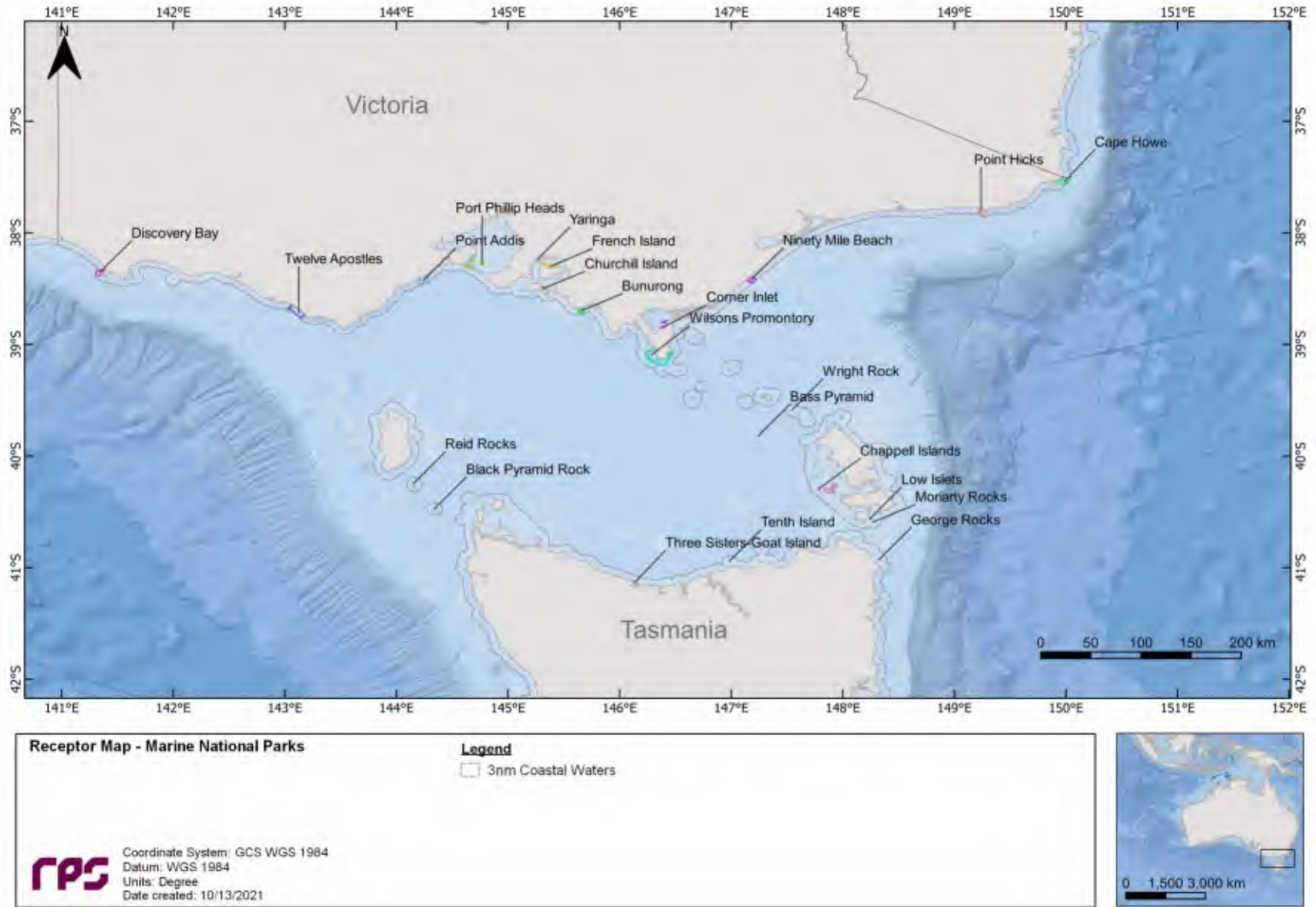


Figure 10.4 Receptor map for Marine National Parks (MNP).

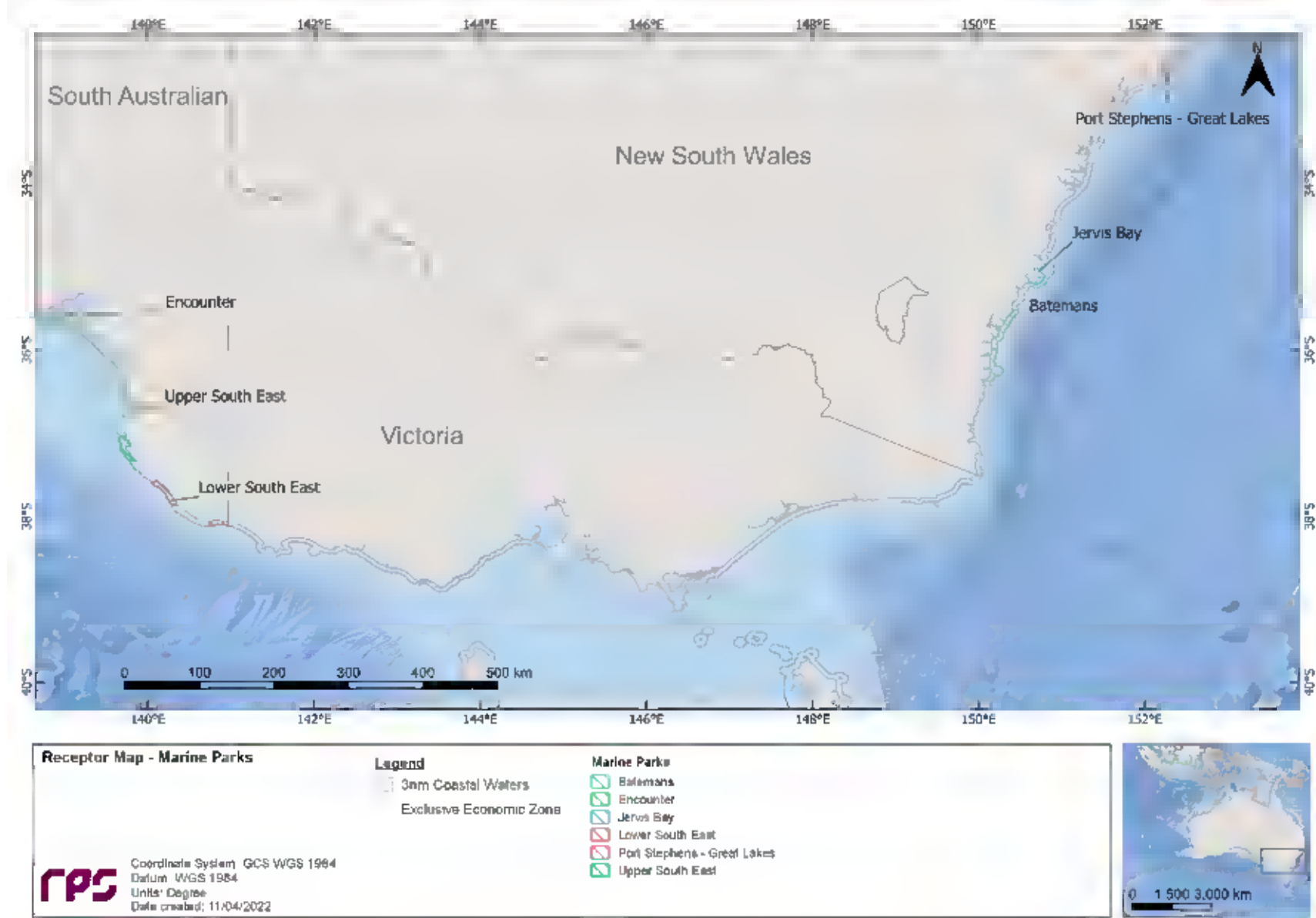


Figure 10.5 Receptor map for Marine Parks (MP).

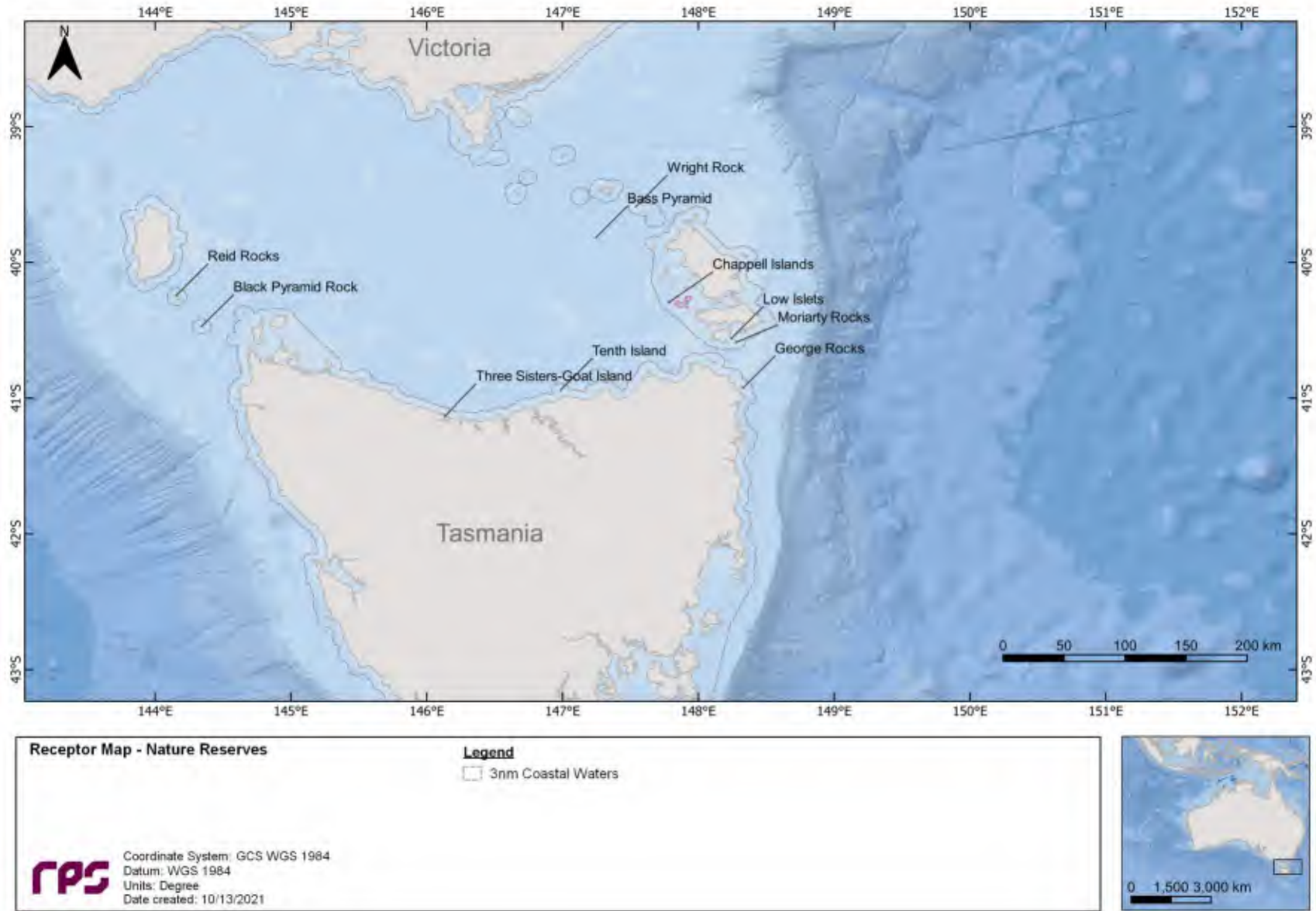


Figure 10.6 Receptor map for Nature Reserves (NR).

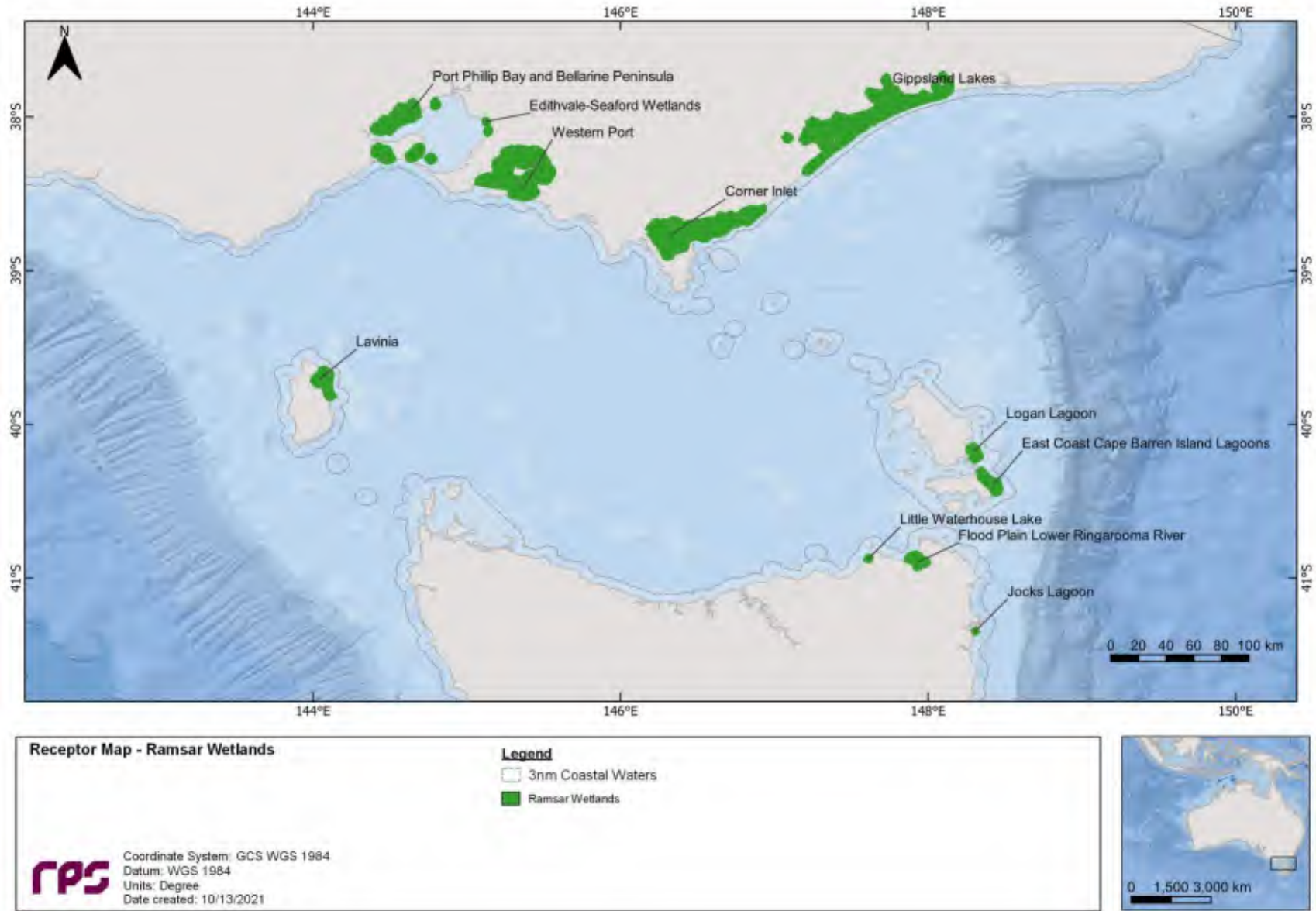


Figure 10.7 Receptor map for Ramsar Sites (Ramsar).

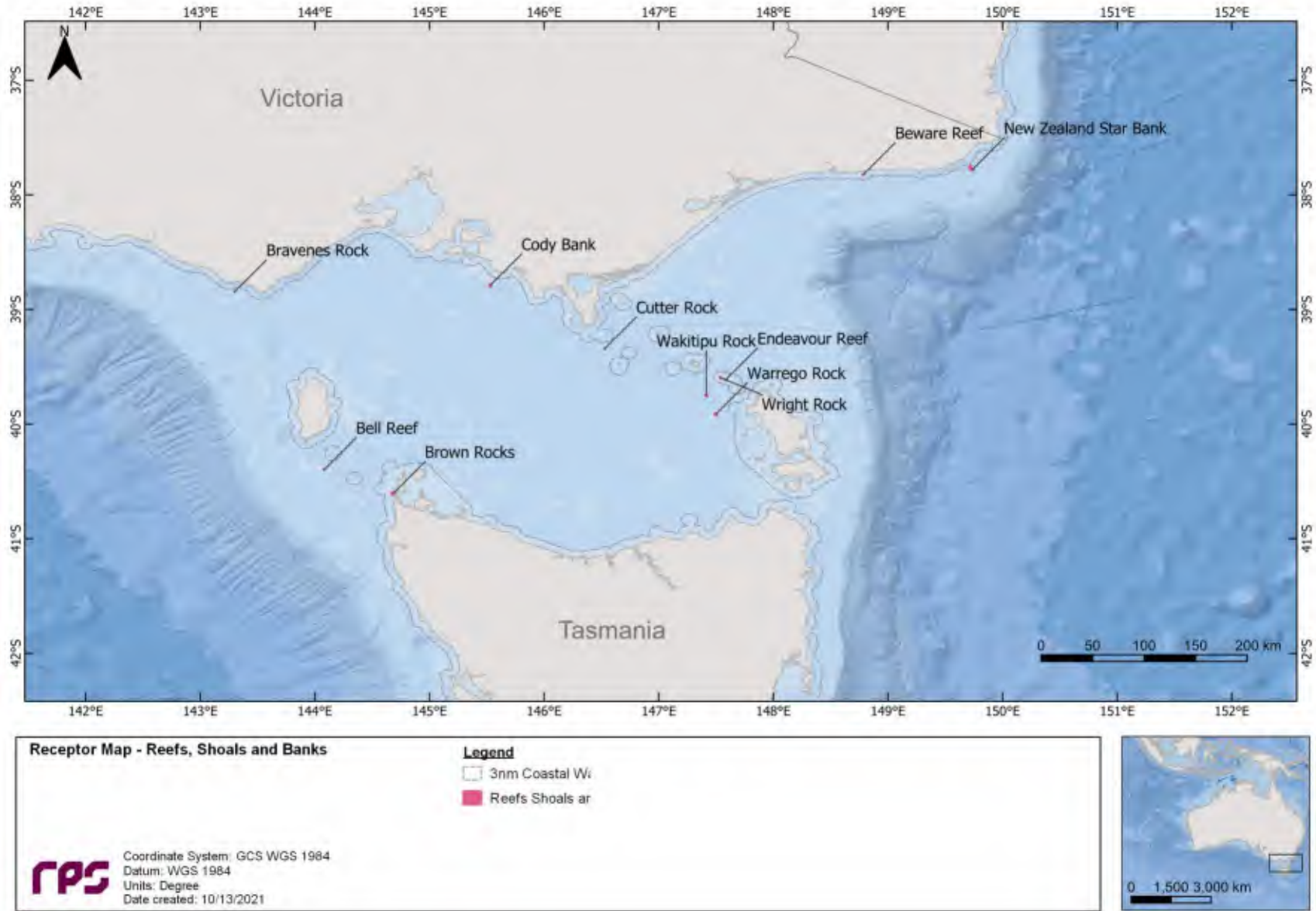


Figure 10.8 Receptor map for Reefs, Shoals and Banks (RSB).

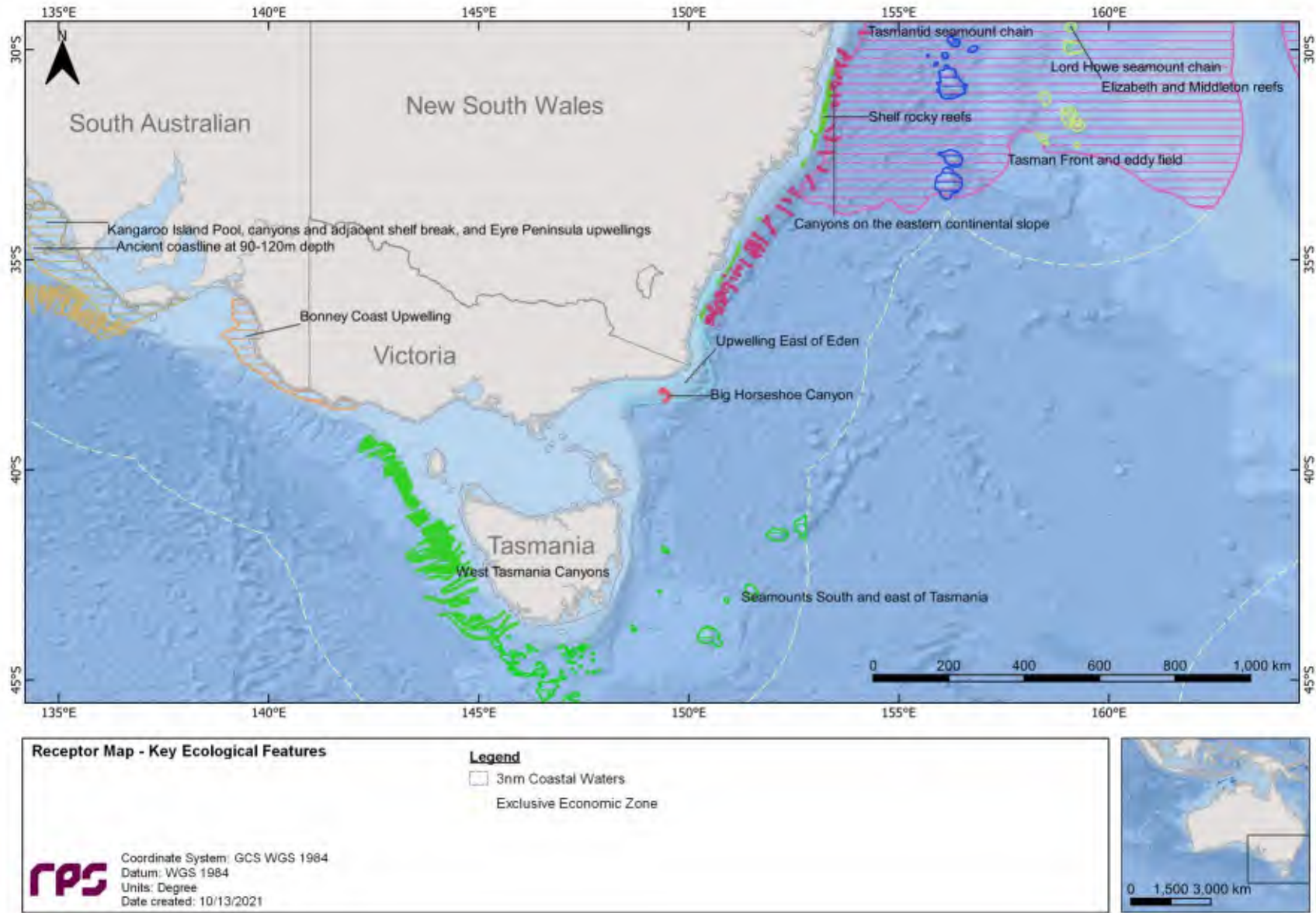


Figure 10.9 Receptor map for Key Ecological Features (KEF).

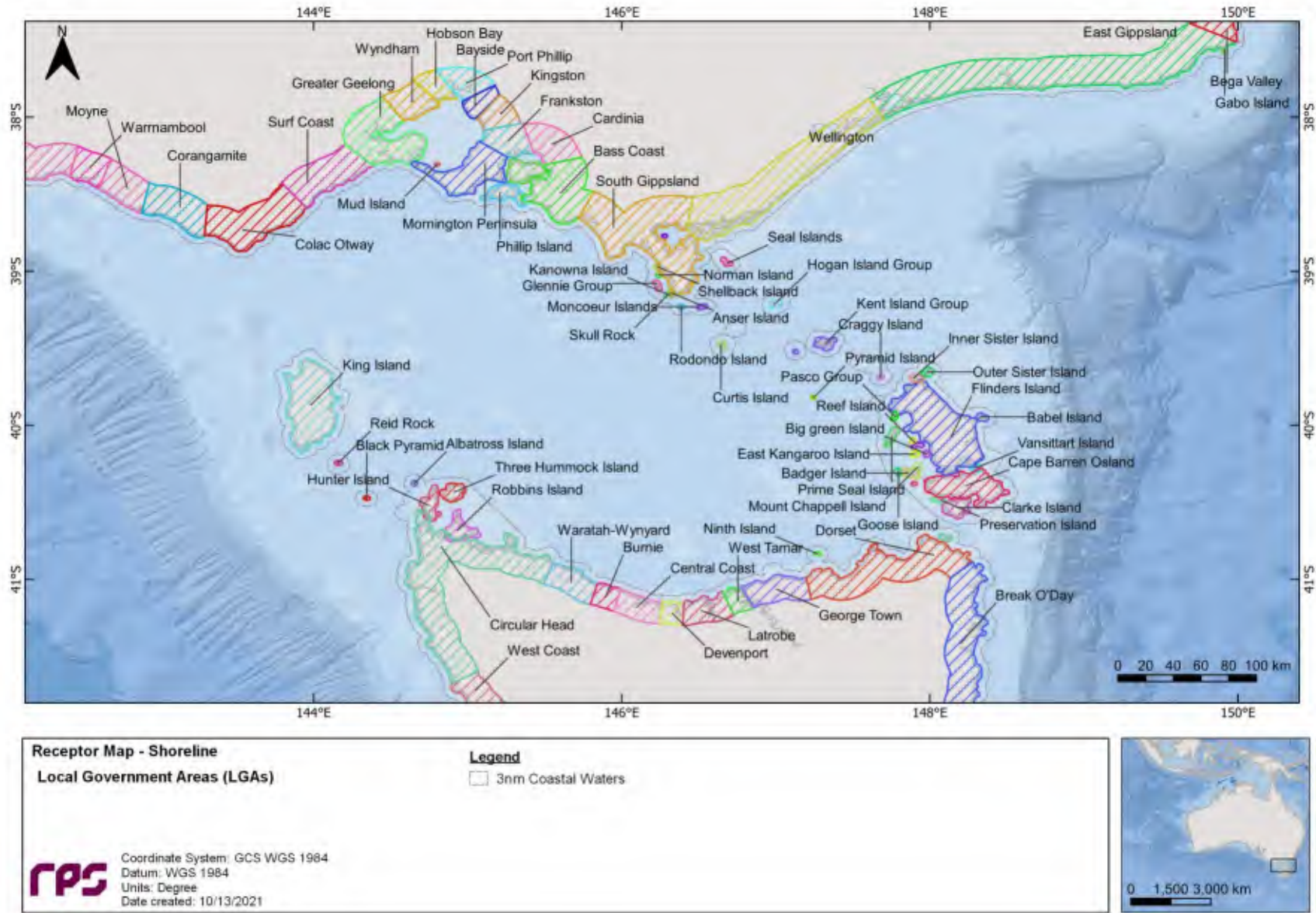


Figure 10.10 Receptor map for shorelines (1 of 3).

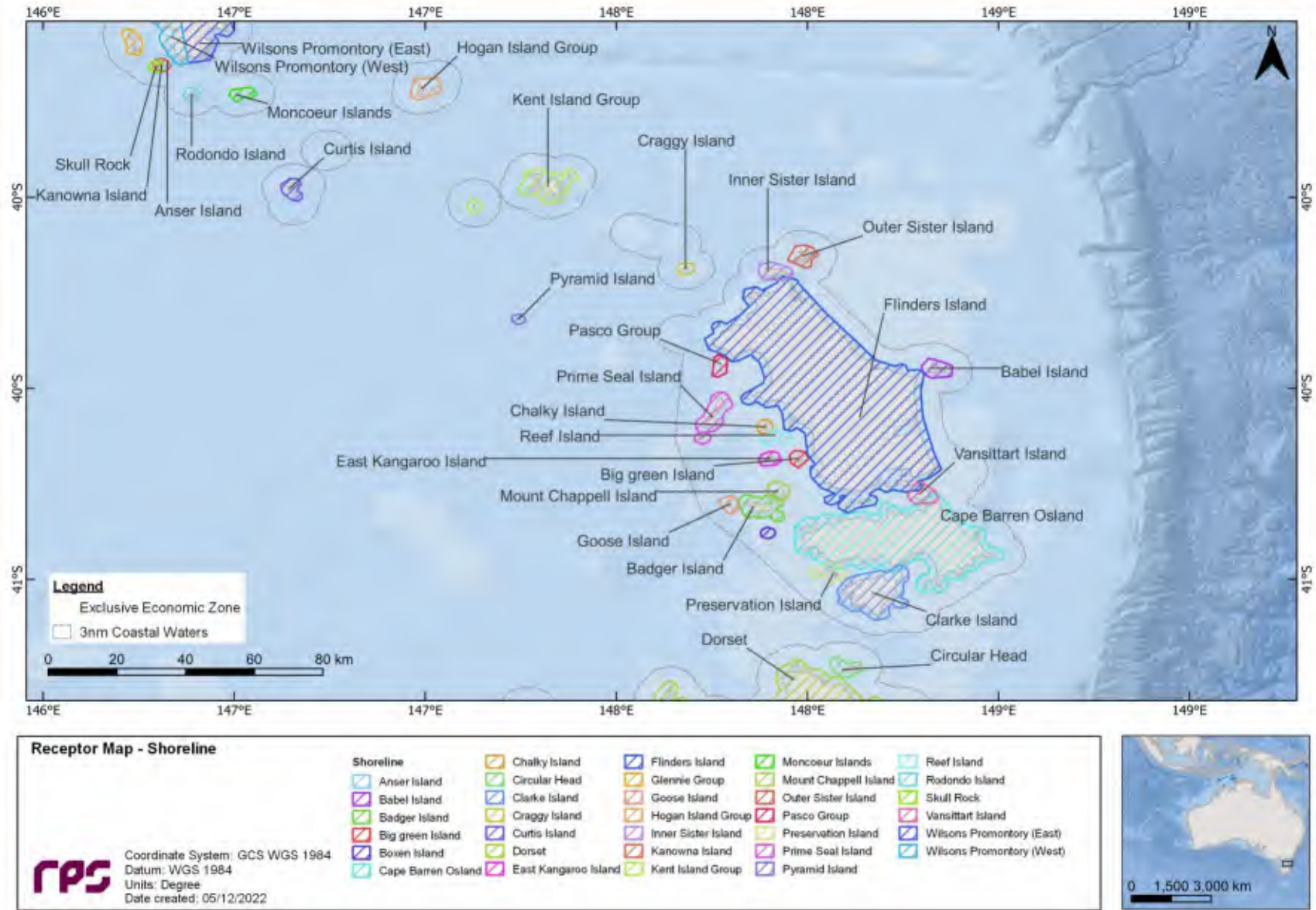


Figure 10.11 Receptor map for shorelines (2 of 3).

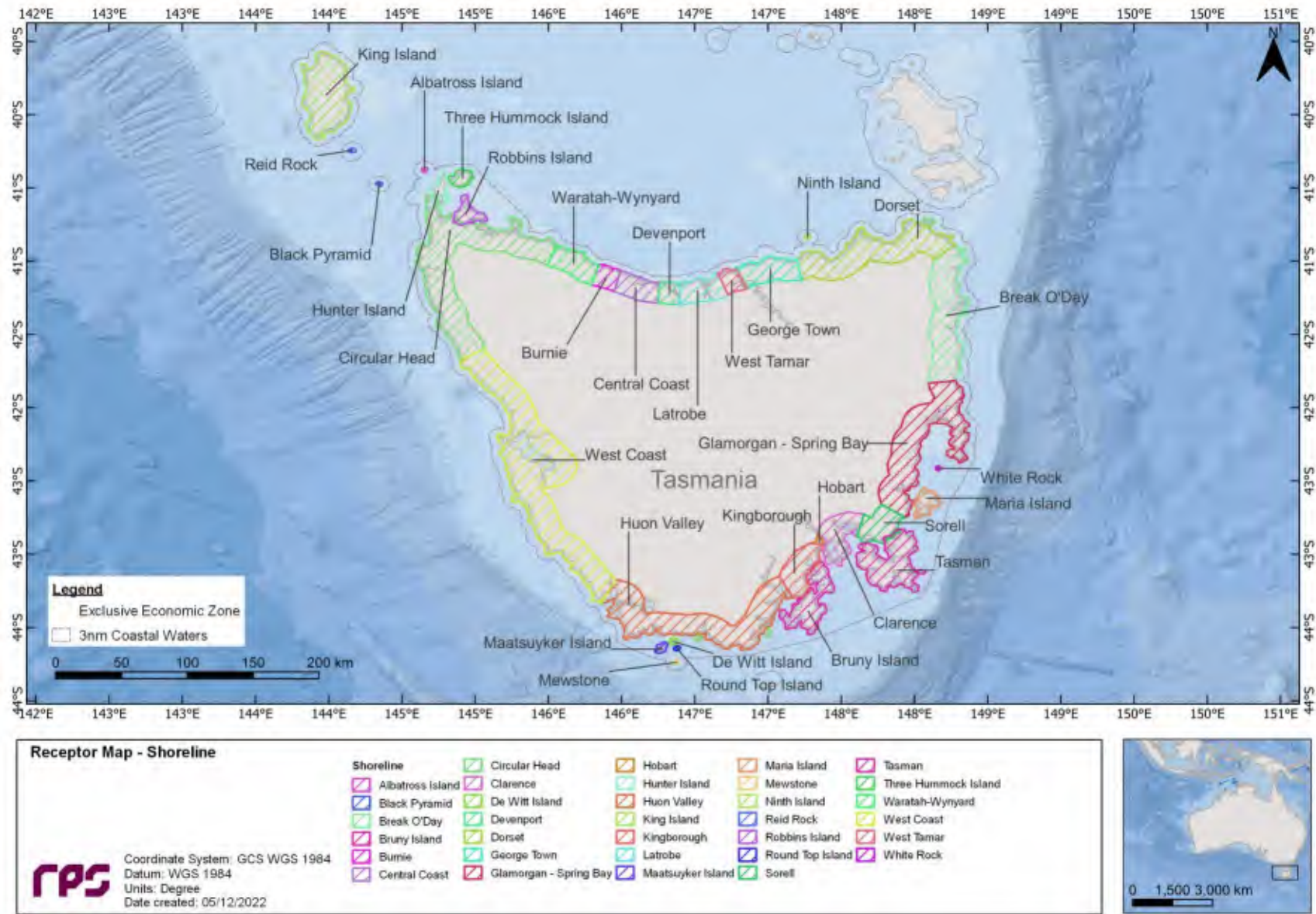


Figure 10.12 Receptor map for shorelines (3 of 3).

11 MODEL SETTINGS

Table 11-1 provides a summary of the spill modelling inputs and thresholds.

The potential risk of exposure to the surrounding waters and contact to shorelines was assessed for summer (October to March) and winter conditions (April to September).

The simulation length was carefully selected based on extensive sensitivity testing. During the sensitivity testing process, sample spill simulations were run for longer than intended durations. Upon completion of the spill simulations, the results were carefully assessed to examine the persistence of the hydrocarbon (i.e. whether the maximum evaporative loss has been achieved for the period of time modelled; and whether a substantial volume of hydrocarbons remain in the water column (if any)) in conjunction with the extent of floating oil exposure based on reporting thresholds. Once there was agreement between the two factors (i.e. the final fate of hydrocarbon is accounted for, and the full exposure area is identified) the simulation length was deemed appropriate.

Table 11-1 Summary of the of the oil spill modelling inputs and thresholds.

Parameter	Locations 1 - 3
Number of randomly selected spill start times per season	100
Model period	Summer (October to March) and winter conditions (April to September)
Oil type	Thylacine condensate
Spill release rate (m ³ /day)	1,549
Spill volume (m ³)	139,400
Release type	Subsea
Release duration (days)	90
Simulation length (days)	120
Floating oil exposure thresholds (g/m ²)	1 (low exposure)
	10 (moderate exposure)
	50 (high exposure)
Shoreline accumulation thresholds (g/m ²)	10 (low potential exposure)
	100 (moderate potential exposure)
	1,000 (high potential exposure)
Dissolved hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, potential low exposure)
	50 (50 ppb x 1 hr, potential moderate exposure)
	400 (400 ppb x 1 hr, potential high exposure)
Entrained hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, potential low exposure)
	100 (100 ppb x 1 hr, potential high exposure)

12 CALCULATION OF EXPOSURE RISK

The stochastic sampling approach provides an objective measure of the possible outcomes of a spill because randomly selected environmental conditions with more simulations will tend to use the most commonly occurring conditions, while more unusual conditions will be represented less frequently.

During each simulation, the SIMAP model records the location (by latitude, longitude and depth) of each of the particles (representing a given mass of oil) on or in the water column, at regular time steps. For any particles that contact a shoreline, the model records the accumulation of oil mass that arrives on each section of shoreline over time, less any mass that is lost to evaporation and/or subsequent removal by current and wind forces.

The collective records from all simulations are then analysed by dividing the study region into a three-dimensional grid. For oil particles that are classified as being at the water surface (floating oil), the sum of the mass in all oil particles (including accounting for spreading and dispersion effects) located within a grid cell, divided by the area of the cell provides estimates of the concentration of oil in that grid cell, at each time step. For entrained and dissolved hydrocarbons particles, concentrations are calculated at each time step by summing the mass of particles within a grid cell and dividing by the volume of the grid cell.

The concentrations of oil calculated for each grid cell, at each time step, are then analysed to determine whether concentration estimates exceed defined threshold concentrations over time.

Risks are then summarised as follows:

- The probability of exposure to a location is calculated by dividing the number of spill simulations where any contact occurred above a specified threshold at that location by the total number of replicate spill simulations. For example, if contact occurred at a location (above a specified threshold) during 21 out of 100 simulations, a probability of exposure of 21% is indicated;
- The minimum potential time to a shoreline location is calculated by the shortest time over which oil at a concentration above a threshold was calculated to travel from the source to the location in any of the replicate simulations;
- The maximum potential concentration of oil predicted for each shoreline section is the greatest mass per m² of shoreline calculated to strand at any location within that section during any of the replicate simulations; and
- Similar treatments were undertaken for entrained and dissolved hydrocarbon exposures.

Thus, the minimum time to shoreline and the maximum potential concentration estimates indicate the worst potential outcome of the modelled spill scenario for each section of shoreline. However, the average over the replicates presents an average of the potential outcomes, in terms of hydrocarbons that could strand.

Note also that results quoted for sections of shoreline are derived for any individual location within that section, as a conservative estimate. Locations will represent shoreline lengths of the order of ~1 km, while sections or regions will represent shorelines spanning tens to hundreds of kilometres. The maximum potential concentrations quoted will not necessarily occur over the full extent of each section, therefore multiplying the maximum concentration estimates by the full area of the section is not recommended as this will greatly overestimate the total volume expected on that section.

13 LOCATION 1 LOWC RESULTS

This scenario examined the potential exposure following a subsea LOWC at Location 1. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 13.1 presents the low threshold EMBA, Section 13.2 shows the seasonal (or stochastic) analysis results, while Section 13.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

13.1 EMBA

Figure 13.1 shows the EMBA for Location 1. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

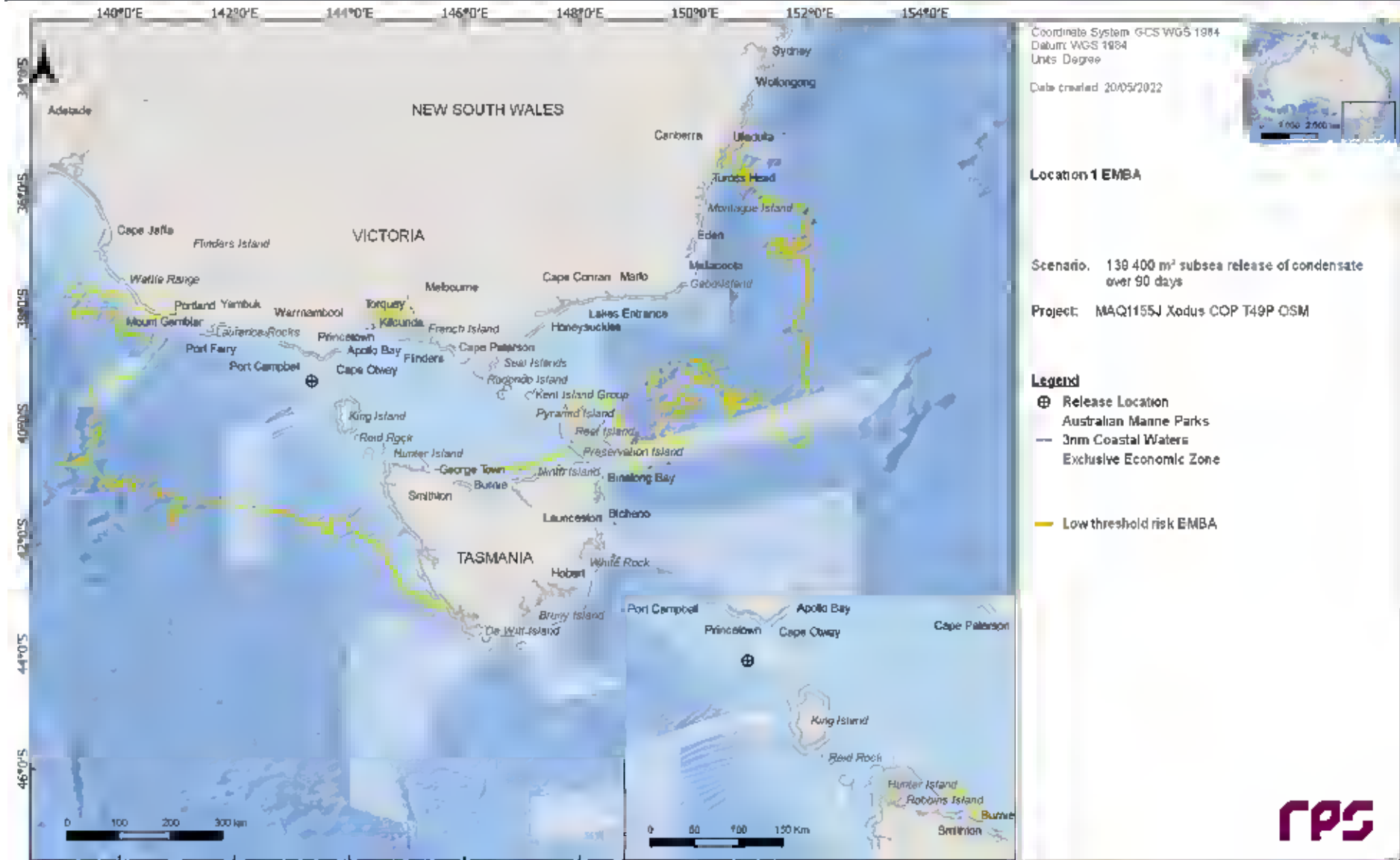


Figure 13.1 Predicted low threshold EMBA from a subsea LOWC at Location 1. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

13.2 Stochastic Analysis

13.2.1 Floating Oil Exposure

Table 13-1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 13-2 summarises the potential floating oil exposure to individual receptors for each season. The exposure by floating oil to BIAs can be found in Appendix A.

Figure 13.2 to Figure 13.3 illustrate the extent of floating oil exposure for each season.

The largest swept area of floating oil exposure at or above the low threshold during winter and summer conditions for a single simulation was 1,357 km² and 1,112 km², respectively.

Table 13-1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	275.0	13.6	-
	Maximum distance (km) from release location (99 th percentile)	101.4	12.4	-
	Direction	E	ENE	-
Winter	Maximum distance (km) from release location	256.8	13.6	-
	Maximum distance (km) from release location (99 th percentile)	152.1	12.9	-
	Direction	E	ENE	-

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Table 13-2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 1 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
AMP	Apollo	100	-	-	0.33	-	-	100	-	-	0.42	-	-
	Zeehan	6	-	-	12.42	-	-	2	-	-	21.29	-	-
IBRA	Gippsland Plain	-	-	-	-	-	-	3	-	-	20.46	-	-
	King Island	1	-	-	99.92	-	-	13	-	-	12.88	-	-
	Otway Plain	9	-	-	63	-	-	17	-	-	7.04	-	-
	Otway Ranges	6	-	-	47.96	-	-	16	-	-	9.25	-	-
	Warrnambool Plain	-	-	-	-	-	-	4	-	-	27.38	-	-
	Wilson's Promontory	1	-	-	94.21	-	-	6	-	-	16.63	-	-
	Central Bass Strait	98	-	-	1	-	-	100	-	-	0.79	-	-
IMCRA	Central Victoria	57	-	-	3.54	-	-	72	-	-	3.08	-	-
	Flinders	1	-	-	94.21	-	-	13	-	-	10.08	-	-
	Otway	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
KEF	West Tasmania Canyons	49	-	-	2.25	-	-	13	-	-	16.75	-	-
MNP	Twelve Apostles	-	-	-	-	-	-	7	-	-	28.58	-	-
	Wilson's Promontory	-	-	-	-	-	-	4	-	-	16.63	-	-
NPS4	Wilson's Promontory Marine Park	-	-	-	-	-	-	2	-	-	64.96	-	-
	Colac Otway	10	-	-	47.96	-	-	20	-	-	7.04	-	-
Near Shore Waters	Corangamite	-	-	-	-	-	-	7	-	-	19.08	-	-
	Kanowna Island	-	-	-	-	-	-	2	-	-	16.63	-	-
	King Island	1	-	-	99.92	-	-	13	-	-	12.88	-	-
	Moncoeur Islands	1	-	-	94.21	-	-	-	-	-	-	-	-
	Norman Island	-	-	-	-	-	-	3	-	-	36.54	-	-
	South Gippsland	-	-	-	-	-	-	3	-	-	20.46	-	-
	Tasmania	1	-	-	99.92	-	-	31	-	-	4.67	-	-
State Waters	Victoria	19	-	-	9.63	-	-	41	-	-	4.75	-	-

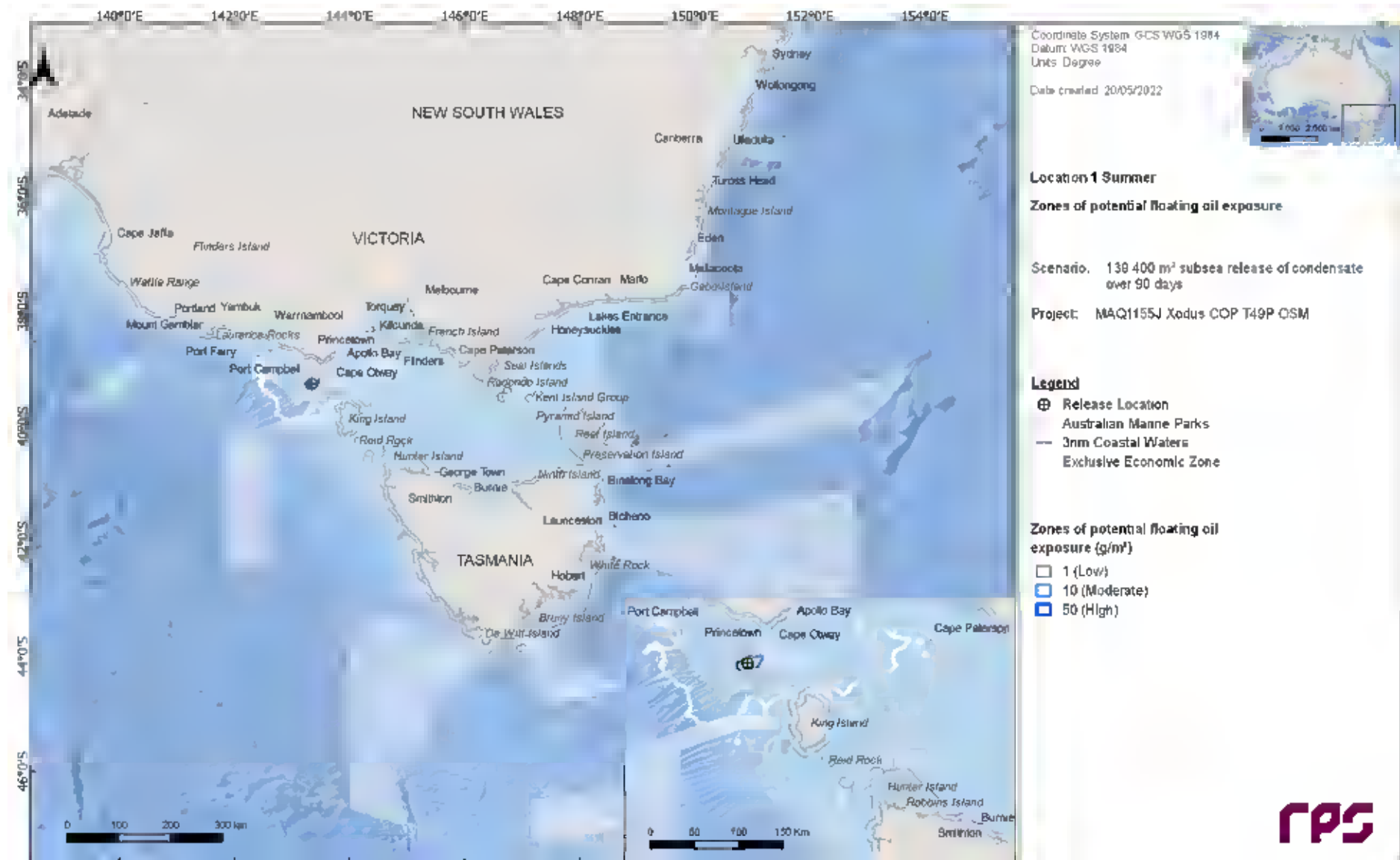


Figure 13.2 Zones of potential floating oil exposure from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

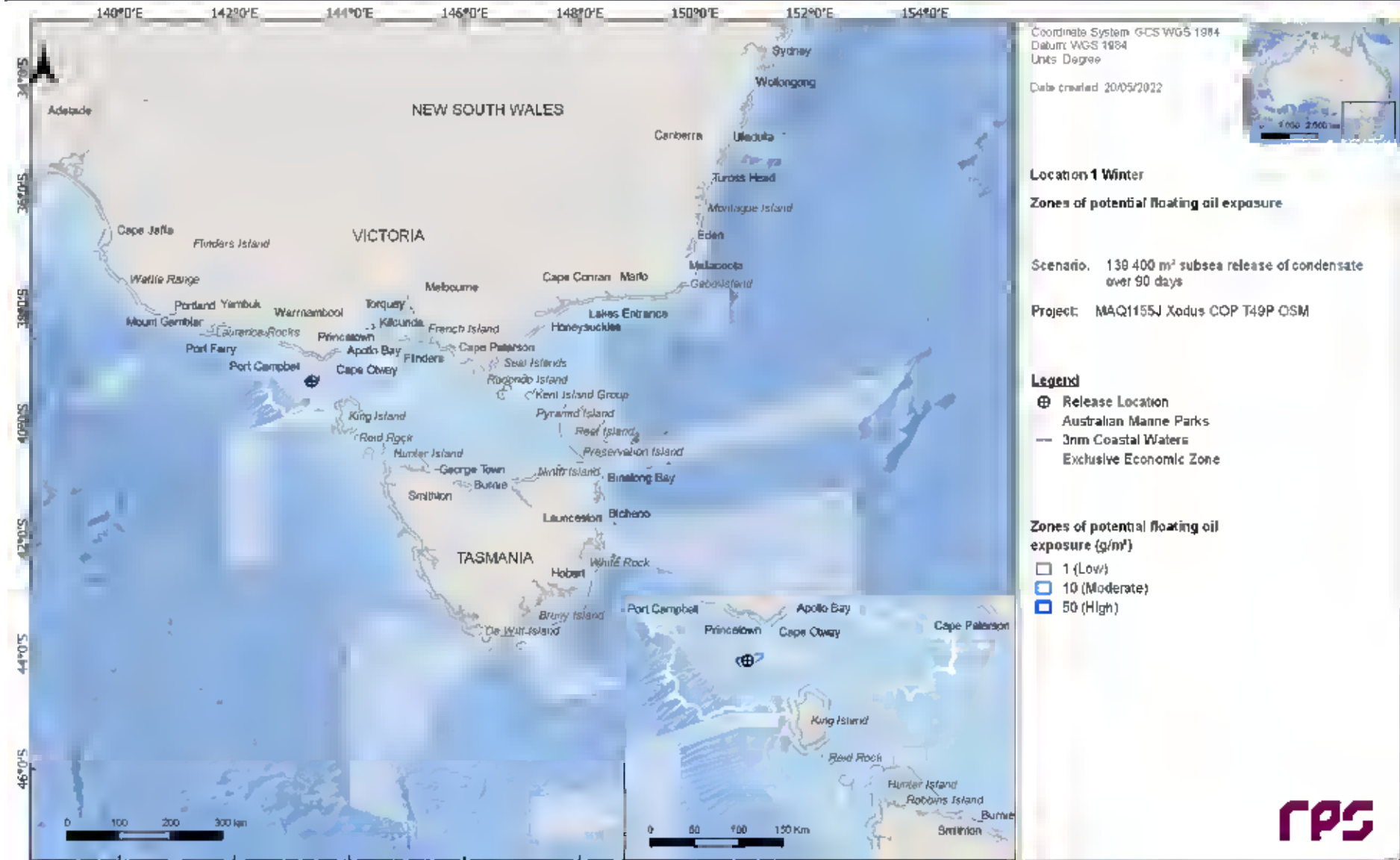


Figure 13.3 Zones of potential floating oil exposure from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.2.2 Shoreline Accumulation

Table 13-3 summarises the predicted oil accumulation on any shoreline during each season.

Table 13-4 to Table 13-5 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 13.4 and Figure 13.5.

Table 13-3 Summary of accumulation on any shoreline from a subsea LOWC at Location 1 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	98	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	10	8.29
Maximum volume of hydrocarbons ashore (m ³)	6.1	20.0
Average volume of hydrocarbons ashore (m ³)	0.6	1.6
Maximum length of the shoreline at 10 g/m² (km)	83	121
Average shoreline length (km) at 10 g/m² (km)	19.3	41.6
Maximum length of the shoreline at 100 g/m² (km)	7	8
Average shoreline length (km) at 100 g/m² (km)	2.9	2.9
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 13-4 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 1 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	12	-	-	27.29	-	-	4	40	< 0.1	< 0.1	1	-	-	1	-	-
Bass Coast	3	-	-	47.42	-	-	2	15	< 0.1	< 0.1	1	-	-	1	-	-
Bega Valley	4	-	-	51.71	-	-	2	20	< 0.1	< 0.1	1.4	-	-	2.9	-	-
Circular Head	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colac Otway	57	6	-	10.21	64.92	-	5	242	0.3	5.7	10.3	3.7	-	47.8	6.7	-
Corangamite	29	-	-	10	-	-	3	66	< 0.1	0.2	5.5	-	-	14.3	-	-
Curtis Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Gippsland	5	-	-	81.5	-	-	1	19	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Eurobodalla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
French Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gabo Island	1	-	-	68.83	-	-	3	16	< 0.1	< 0.1	1.9	-	-	1.9	-	-
Glenelg	2	-	-	46.88	-	-	1	53	< 0.1	0.1	11	-	-	11.5	-	-
Glennie Group	9	-	-	18.96	-	-	3	25	< 0.1	0.1	1.7	-	-	2.9	-	-
Greater Geelong	2	-	-	36.75	-	-	1	16	< 0.1	0.1	4.3	-	-	4.8	-	-
Hogan Island Group	6	-	-	75.21	-	-	2	26	< 0.1	< 0.1	1	-	-	1	-	-
Hunter Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kanowna Island	12	-	-	25.88	-	-	3	21	< 0.1	0.1	1	-	-	1.9	-	-
Kent Island Group	1	-	-	96.33	-	-	1	30	< 0.1	0.1	2.9	-	-	2.9	-	-
King Island	58	3	-	13.54	64.83	-	4	293	0.2	3.1	9.9	1	-	22	1	-
Lady Julia Percy Island	2	-	-	41.17	-	-	3	14	< 0.1	< 0.1	1	-	-	1	-	-
Laurence Rocks	1	-	-	49.5	-	-	3	25	< 0.1	< 0.1	1	-	-	1	-	-
Moncoeur Islands	4	-	-	59.83	-	-	2	19	< 0.1	< 0.1	1.2	-	-	1.9	-	-
Montague Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mornington Peninsula	8	-	-	22.83	-	-	2	35	< 0.1	0.1	2.9	-	-	12.4	-	-

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Moyno	7	-	-	32.5	-	-	2	32	< 0.1	< 0.1	3	-	-	7.6	-	-
Norman Island	19	-	-	19.71	-	-	4	43	< 0.1	0.3	1.3	-	-	1.9	-	-
Phillip Island	8	-	-	22.92	-	-	2	50	< 0.1	< 0.1	2.4	-	-	5.7	-	-
Reid Rock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rodondo Island	1	-	-	80.21	-	-	4	10	< 0.1	< 0.1	1	-	-	1	-	-
Seal Islands	6	-	-	49.88	-	-	3	38	< 0.1	0.2	3.5	-	-	6.7	-	-
Shellback Island	4	-	-	46.83	-	-	4	15	< 0.1	< 0.1	1	-	-	1	-	-
Skull Rock	7	-	-	25.88	-	-	3	21	< 0.1	< 0.1	1	-	-	1	-	-
South Gippsland	28	-	-	23.38	-	-	3	66	< 0.1	0.5	8.5	-	-	22	-	-
Surf Coast	12	-	-	20.96	-	-	2	31	< 0.1	< 0.1	2.4	-	-	7.6	-	-
Warrnambool	2	-	-	37.67	-	-	1	18	< 0.1	< 0.1	2.9	-	-	2.9	-	-
West Coast	1	-	-	100.75	-	-	< 1	12	< 0.1	< 0.1	1	-	-	1	-	-
Anglesea	5	-	-	21.08	-	-	2	16	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Apollo Bay	36	3	-	14.83	64.92	-	6	174	0.1	5.2	6.3	3.8	-	23.9	6.7	-
Bay of Islands	7	-	-	32.5	-	-	2	32	< 0.1	< 0.1	2.2	-	-	5.7	-	-
Bega Valley	4	-	-	51.71	-	-	2	20	< 0.1	< 0.1	1.4	-	-	2.9	-	-
Cape Conran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cape Howe / Mallacoota	1	-	-	81.5	-	-	1	12	< 0.1	< 0.1	1	-	-	1	-	-
Cape Liptrap (NW)	19	-	-	33.38	-	-	3	57	< 0.1	0.2	4.2	-	-	10.5	-	-
Cape Nelson	2	-	-	46.88	-	-	2	53	< 0.1	< 0.1	5.3	-	-	5.7	-	-
Cape Otway West	48	4	-	10.21	65.13	-	6	242	0.1	2.9	6.2	2.6	-	24.9	2.9	-
Cape Patton	19	-	-	14.5	-	-	3	77	< 0.1	0.3	3.3	-	-	13.4	-	-
Childers Cove	2	-	-	45.96	-	-	1	14	< 0.1	< 0.1	2.4	-	-	2.9	-	-
Croajingolong (East)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croajingolong (West)	3	-	-	81.71	-	-	1	19	< 0.1	< 0.1	1	-	-	1	-	-
Eurobodalla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
French Island / San Remo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kilcunda	1	-	-	47.42	-	-	1	12	< 0.1	< 0.1	1	-	-	1	-	-
Lorne	10	-	-	20.96	-	-	2	31	< 0.1	< 0.1	2.3	-	-	6.7	-	-

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Moonlight Head	27	-	-	10	-	-	4	66	< 0.1	0.2	4.2	-	-	8.6	-	-
Mornington Peninsula (S)	5	-	-	22.83	-	-	2	23	< 0.1	< 0.1	2.7	-	-	7.6	-	-
Mornington Peninsula (SW)	5	-	-	39.63	-	-	2	35	< 0.1	< 0.1	1.7	-	-	3.8	-	-
Point Hicks	2	-	-	100.17	-	-	2	12	< 0.1	< 0.1	1	-	-	1	-	-
Port Campbell	7	-	-	33.88	-	-	2	45	< 0.1	0.1	4.9	-	-	9.6	-	-
Port Fairy	2	-	-	47	-	-	1	11	< 0.1	< 0.1	1.4	-	-	1.9	-	-
Port Phillip (Queenscliff)	2	-	-	38.29	-	-	1	16	< 0.1	0.1	3.8	-	-	4.8	-	-
Port Phillip (Sorrento Shore)	1	-	-	56.08	-	-	2	11	< 0.1	< 0.1	1	-	-	1	-	-
Portland Bay (East)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portland Bay (West)	2	-	-	48.42	-	-	2	31	< 0.1	< 0.1	5.7	-	-	6.7	-	-
Torquay	3	-	-	36.75	-	-	2	16	< 0.1	< 0.1	1.3	-	-	1.9	-	-
Venus Bay	4	-	-	50.17	-	-	2	19	< 0.1	< 0.1	1.2	-	-	1.9	-	-
Waratah Bay	13	-	-	41.92	-	-	2	60	< 0.1	0.2	3.8	-	-	8.6	-	-
Warmambool	2	-	-	37.67	-	-	1	18	< 0.1	< 0.1	1.9	-	-	2.9	-	-
Westernport	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wilson's Promontory (East)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wilson's Promontory (West)	26	-	-	23.38	-	-	3	66	< 0.1	0.4	4.1	-	-	12.4	-	-

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Table 13-5 Summary of oil accumulation on individual shoreline sectors from a subsea LOWC at Location 1 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	45	3	-	10.21	16.75	-	13	122	< 0.1	1.5	1.3	1.3	-	1.9	1.9	-
Bass Coast	17	-	-	18.21	-	-	3	98	< 0.1	2.1	8	-	-	16.3	-	-
Bega Valley	12	-	-	21.17	-	-	2	18	< 0.1	0.2	1.1	-	-	1.9	-	-
Circular Head	3	-	-	33.38	-	-	1	24	< 0.1	< 0.1	1.6	-	-	1.9	-	-
Colac Otway	52	8	-	8.63	9.33	-	7	274	0.2	2.4	11.2	3.9	-	46.8	5.7	-
Corangamite	24	-	-	8.88	-	-	4	48	< 0.1	0.8	7.7	-	-	18.2	-	-
Curtis Island	22	-	-	10.96	-	-	5	40	< 0.1	< 0.1	1.8	-	-	2.9	-	-
East Gippsland	21	-	-	30.29	-	-	2	19	< 0.1	< 0.1	1.2	-	-	3.8	-	-
Eurobodalla	2	-	-	75.88	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
French Island	1	-	-	30.21	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
Gabo Island	2	-	-	39.38	-	-	2	16	< 0.1	0.1	1	-	-	1	-	-
Glenelg	5	-	-	60.17	-	-	5	38	< 0.1	0.3	8.4	-	-	10.5	-	-
Glennie Group	55	4	-	10.67	17.13	-	11	338	< 0.1	1.5	3.4	2.2	-	7.6	2.9	-
Greater Geelong	6	-	-	52.5	-	-	2	22	< 0.1	0.1	3.8	-	-	6.7	-	-
Hogan Island Group	32	7	-	10	11.96	-	6	178	< 0.1	1.2	2.7	1.2	-	8.6	1.9	-
Hunter Island	1	-	-	67.83	-	-	1	12	< 0.1	< 0.1	1	-	-	1	-	-
Kanowna Island	51	4	-	10.25	17.08	-	11	190	< 0.1	2	1.9	1.2	-	3.8	1.9	-
Kent Island Group	29	-	-	20.38	-	-	3	69	< 0.1	1	2.4	-	-	5.7	-	-
King Island	77	13	-	8.29	15.96	-	6	252	0.4	4	13.9	1.5	-	32.5	2.9	-
Lady Julia Percy Island	1	-	-	68.79	-	-	7	11	< 0.1	< 0.1	1	-	-	1	-	-
Laurence Rocks	4	-	-	62.29	-	-	5	25	< 0.1	< 0.1	1	-	-	1	-	-
Moncoeur Islands	40	-	-	11.25	-	-	9	93	< 0.1	0.2	2	-	-	3.8	-	-
Montague Island	8	-	-	60.33	-	-	4	19	< 0.1	< 0.1	1.2	-	-	1.9	-	-
Mornington Peninsula	17	-	-	15.25	-	-	2	46	< 0.1	< 0.1	4.5	-	-	19.1	-	-

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Moyne	9	-	-	11.63	-	-	3	32	< 0.1	0.4	4.2	-	-	8.6	-	-
Norman Island	51	1	-	16.58	36.75	-	11	460	< 0.1	3.5	2.1	2.9	-	4.8	2.9	-
Phillip Island	22	6	-	16.42	33.21	-	4	173	0.1	2.9	6.2	1.6	-	17.2	2.9	-
Reid Rock	1	-	-	22.88	-	-	1	10	< 0.1	< 0.1	1	-	-	1	-	-
Rodondo Island	33	-	-	13.04	-	-	12	93	< 0.1	< 0.1	1	-	-	1	-	-
Seal Islands	23	-	-	21.08	-	-	4	52	< 0.1	0.3	2.7	-	-	7.6	-	-
Shellback Island	27	-	-	20.13	-	-	10	38	< 0.1	0.2	1	-	-	1	-	-
Skull Rock	46	4	-	10.25	17.08	-	12	190	< 0.1	1.6	1.6	1	-	2.9	1	-
South Gippsland	66	10	-	18.25	19.17	-	5	268	0.4	4.2	11.8	1.5	-	32.5	3.8	-
Surf Coast	7	-	-	43.5	-	-	2	17	< 0.1	< 0.1	1.2	-	-	1.9	-	-
Warrnambool	6	-	-	51.29	-	-	3	28	< 0.1	< 0.1	3.2	-	-	5.7	-	-
West Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anglesea	1	-	-	79.75	-	-	2	11	< 0.1	< 0.1	1	-	-	1	-	-
Apollo Bay	39	4	-	8.71	21.33	-	6	181	< 0.1	0.8	5.4	3.3	-	22	5.7	-
Bay of Islands	9	-	-	11.63	-	-	3	32	< 0.1	0.3	2.5	-	-	4.8	-	-
Bega Valley	12	-	-	21.17	-	-	2	18	< 0.1	0.2	1.1	-	-	1.9	-	-
Cape Conran	1	-	-	45.67	-	-	2	10	< 0.1	< 0.1	1	-	-	1	-	-
Cape Howe / Mallacoota	2	-	-	30.29	-	-	2	18	< 0.1	< 0.1	1	-	-	1	-	-
Cape Liptrap (NW)	38	1	-	18.29	85.58	-	5	125	< 0.1	1.3	5.5	1	-	15.3	1	-
Cape Nelson	5	-	-	60.17	-	-	5	38	< 0.1	0.1	4.4	-	-	5.7	-	-
Cape Otway West	39	6	-	8.63	9.33	-	10	274	0.1	2.4	7.9	3	-	25.8	3.8	-
Cape Patton	19	-	-	29.63	-	-	3	90	< 0.1	0.2	2.9	-	-	13.4	-	-
Childers Cove	6	-	-	50.46	-	-	3	24	< 0.1	< 0.1	2.7	-	-	3.8	-	-
Croajingolong (East)	2	-	-	52.21	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
Croajingolong (West)	10	-	-	38.83	-	-	2	18	< 0.1	< 0.1	1.2	-	-	1.9	-	-
Eurobodalla	2	-	-	75.88	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
French Island / San Remo	4	-	-	68.79	-	-	2	22	< 0.1	< 0.1	1	-	-	1	-	-
Kilcunda	8	-	-	22.54	-	-	3	79	< 0.1	1.2	8.8	-	-	11.5	-	-
Lorne	8	-	-	34.33	-	-	2	25	< 0.1	< 0.1	1.9	-	-	3.8	-	-

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Moonlight Head	23	-	-	8.92	-	-	4	43	< 0.1	0.4	4	-	-	8.6	-	-
Mornington Peninsula (S)	14	-	-	15.38	-	-	3	46	< 0.1	< 0.1	3.5	-	-	7.6	-	-
Mornington Peninsula (SW)	8	-	-	15.25	-	-	2	41	< 0.1	< 0.1	2.9	-	-	9.6	-	-
Point Hicks	7	-	-	33.21	-	-	2	19	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Port Campbell	10	-	-	9.83	-	-	4	48	< 0.1	0.5	7.1	-	-	11.5	-	-
Port Fairy	4	-	-	61.75	-	-	3	17	< 0.1	< 0.1	1.4	-	-	1.9	-	-
Port Phillip (Queenscliff)	6	-	-	52.5	-	-	2	22	< 0.1	0.1	3	-	-	5.7	-	-
Port Phillip (Sorrento Shore)	3	-	-	15.63	-	-	2	21	< 0.1	< 0.1	1.3	-	-	1.9	-	-
Portland Bay (East)	1	-	-	108.5	-	-	2	11	< 0.1	< 0.1	1	-	-	1	-	-
Portland Bay (West)	5	-	-	60.21	-	-	5	34	< 0.1	0.2	4	-	-	5.7	-	-
Torquay	5	-	-	57.33	-	-	2	12	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Venus Bay	19	-	-	18.21	-	-	3	98	< 0.1	1.3	3.5	-	-	10.5	-	-
Waratah Bay	24	-	-	19.25	-	-	3	34	< 0.1	0.2	1.4	-	-	2.9	-	-
Warrnambool	5	-	-	51.29	-	-	2	28	< 0.1	< 0.1	2.3	-	-	3.8	-	-
Westernport	1	-	-	27.63	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
Wilson's Promontory (East)	4	-	-	41.38	-	-	2	21	< 0.1	< 0.1	1	-	-	1	-	-
Wilson's Promontory (West)	64	9	-	18.25	19.17	-	7	268	0.3	3.4	8.2	1.6	-	22.9	3.8	-

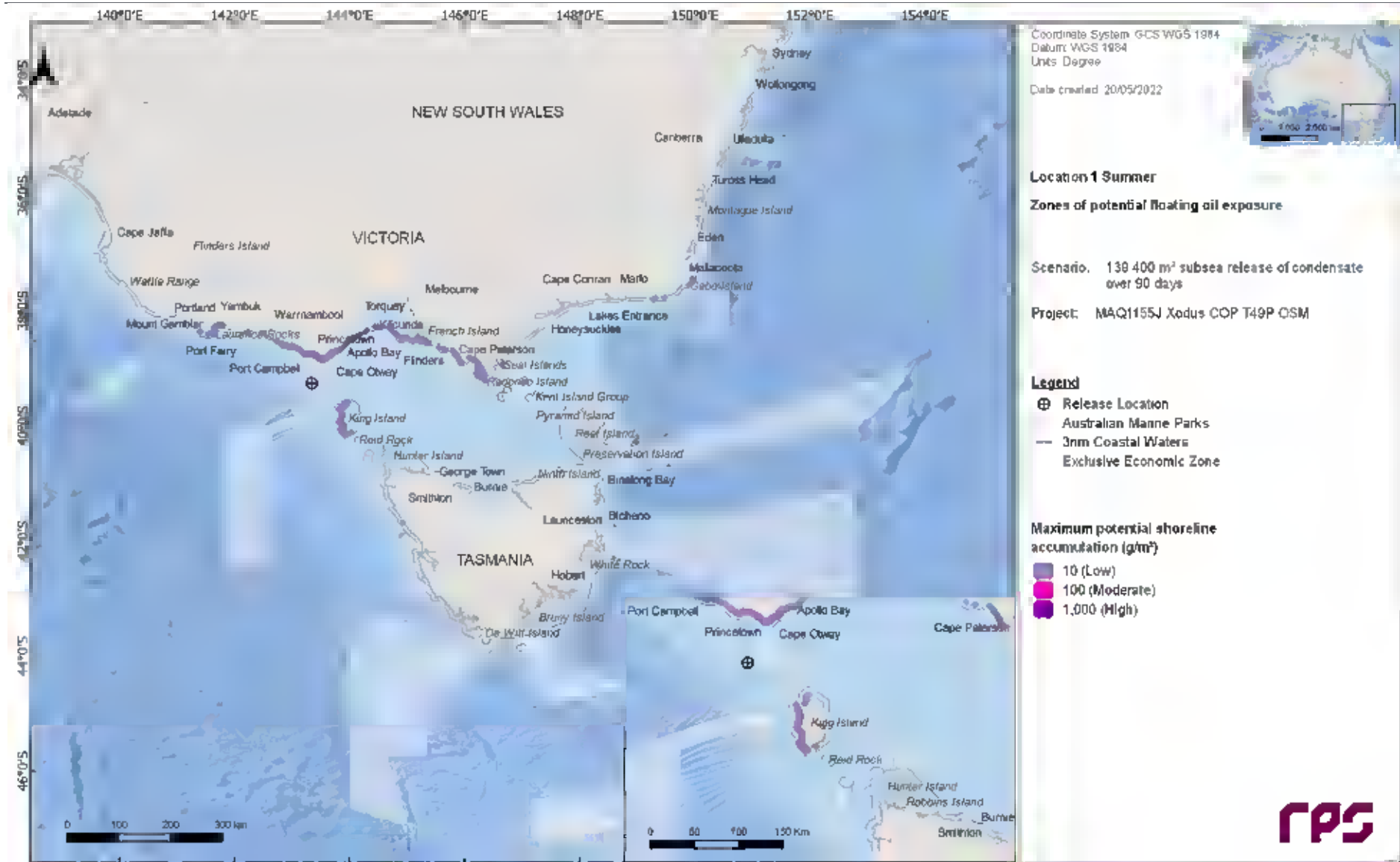


Figure 13.4 Maximum potential shoreline loading from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

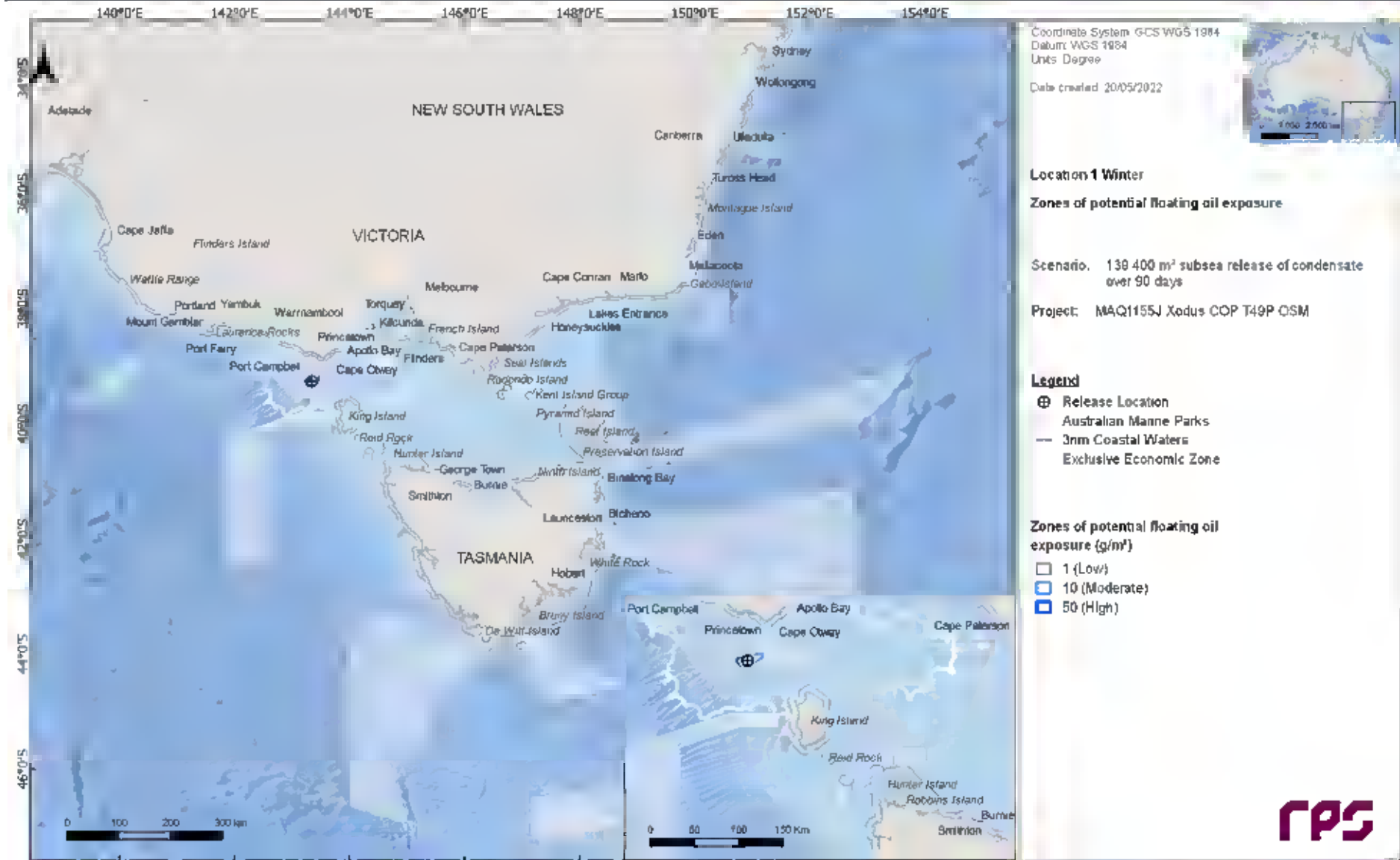


Figure 13.5 Maximum potential shoreline loading from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.2.3 In-water exposure

13.2.3.1 Dissolved Hydrocarbons

Table 13-6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 13-7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m depth layer for each threshold and season.

Figure 13.6 and Figure 13.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers. Figures showing the extent of dissolved hydrocarbon exposure in the 10-20 m, 20 – 30 m and 30 – 50 m depth layers for each season are presented in Appendix A.

Table 13-6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10m) from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	661	656	359
	Maximum distance (km) from release location (99 th percentile)	631	560	179
	Direction	ENE	ENE	E
Winter	Maximum distance (km) from release location	769	722	452
	Maximum distance (km) from release location (99 th percentile)	681	463	327
	Direction	ENE	ENE	ENE

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Table 13-7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Moderate	High		Low	Moderate	High	
AMP	Apollo	6,501	100	100	100	6,003	100	100	100
	Beagle	683	21	9	1	1,386	75	27	3
	Boags	84	2	1	-	15	1	-	-
	East Gippsland	17	1	-	-	25	2	-	-
	Franklin	105	10	1	-	44	4	-	-
	Zeehan	1,577	88	73	9	2,013	63	39	6
IBRA	Bateman	-	-	-	-	34	4	-	-
	Bridgewater	-	-	-	-	16	1	-	-
	East Gippsland Lowlands	162	6	2	-	117	11	1	-
	Flinders	152	13	3	-	352	49	15	-
	Gippsland Plain	122	13	2	-	764	49	4	1
	Glenelg Plain	-	-	-	-	12	1	-	-
	King Island	727	66	37	2	1,887	83	62	8
	Otway Plain	749	67	31	2	746	69	34	2
	Otway Ranges	1,102	60	25	2	659	58	27	2
	South East Coastal Ranges	-	-	-	-	26	3	-	-
	Strzelecki Ranges	82	15	1	-	185	48	6	-
	Warrnambool Plain	487	34	15	1	422	27	12	1
	Wilson's Promontory	423	22	9	1	733	78	31	1
	IMCRA	Batemans Shelf	43	2	-	-	70	5	1
Boags		38	2	-	-	-	-	-	-
Central Bass Strait		4,405	100	99	92	4,718	100	100	100
Central Victoria		2,627	99	92	35	2,898	100	96	43
Flinders		764	29	11	1	1,386	82	41	3
Franklin		112	11	1	-	20	1	-	-
Otway		7,731	100	100	100	6,003	100	100	100
Twofold Shelf		831	15	7	1	1,423	64	17	1
KEF	Victorian Embayments	83	3	1	-	119	7	2	-
	Big Horseshoe Canyon	-	-	-	-	24	1	-	-
	Bonney Coast Upwelling	49	2	-	-	89	6	1	-
	Canyons on the eastern continental slope	-	-	-	-	15	1	-	-
	Shelf rocky reefs	-	-	-	-	20	2	-	-

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	Upwelling East of Eden	384	7	4	-	592	20	5	1
	West Tasmania Canyons	3,715	81	71	24	1,144	37	27	5
MNP	Bunurong	46	5	-	-	58	16	1	-
	Cape Howe	83	4	2	-	100	11	1	-
	Churchill Island	-	-	-	-	22	3	-	-
	Corner Inlet	-	-	-	-	80	2	1	-
	Ninety Mile Beach	-	-	-	-	45	2	-	-
	Point Addis	43	8	-	-	259	18	3	-
	Point Hicks	109	7	2	-	70	12	1	-
	Port Phillip Heads	84	2	1	-	36	5	-	-
	Twelve Apostles	201	27	12	-	249	25	15	-
	Wilsons Promontory	249	19	6	-	314	71	23	-
MS	Beware Reef	179	3	1	-	44	7	-	-
	Marengo Reefs	277	37	13	-	353	48	18	-
	Mushroom Reef	21	4	-	-	79	6	1	-
	The Arches	120	7	2	-	101	8	2	-
NPS4	Bunurong Marine Park	17	2	-	-	28	7	-	-
	Corner Inlet Marine and Coastal Park	-	-	-	-	764	4	2	1
	Nooramunga Marine and Coastal Park	18	1	-	-	245	6	2	-
	Shallow Inlet Marine and Coastal Park	11	1	-	-	466	5	2	1
	Wilsons Promontory Marine Park	59	9	1	-	656	28	3	1
	Wilsons Promontory Marine Reserve	178	16	5	-	139	60	10	-
NP	Kent Group	-	-	-	-	93	10	2	-
	Corner Inlet	18	1	-	-	764	6	2	1
	Gippsland Lakes	-	-	-	-	12	1	-	-
Ramsar	Lavinia	115	6	2	-	207	16	4	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	14	1	-	-	-	-	-	-
	Western Port	12	1	-	-	119	5	1	-
	Bell Reef	58	19	1	-	62	4	1	-
RSB	Beware Reef	179	3	1	-	44	7	-	-
	Bravenes Rock	338	52	30	-	440	43	28	5
	Brown Rocks	20	1	-	-	-	-	-	-
	Cody Bank	101	19	7	-	224	55	12	-
	Cutter Rock	125	16	5	-	317	66	24	-
	New Zealand Star Bank	92	6	2	-	98	11	1	-

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	Albatross Island	18	1	-	-	-	-	-	-	
	Anser Island	122	17	3	-	217	64	16	-	
	Bass Coast	24	4	-	-	32	11	-	-	
	Bega Valley	104	4	2	-	94	11	1	-	
	Black Pyramid	36	3	-	-	17	2	-	-	
	Circular Head	31	1	-	-	-	-	-	-	
	Colac Otway	1,102	67	31	2	746	69	34	2	
	Corangamite	487	40	17	1	481	29	16	1	
	Curtis Island	129	8	3	-	337	46	13	-	
	East Gippsland	162	6	1	-	117	8	1	-	
	Eurobodalla	-	-	-	-	34	4	-	-	
	French Island	-	-	-	-	36	2	-	-	
	Gabo Island	58	3	1	-	39	10	-	-	
	Glenelg	10	-	-	-	16	1	-	-	
	Glennie Group	192	20	5	-	233	67	13	-	
	Greater Geelong	83	1	1	-	23	2	-	-	
	Hogan Island Group	152	13	3	-	352	49	15	-	
	Hunter Island	25	1	-	-	-	-	-	-	
	Kanowna Island	169	16	5	-	217	66	23	-	
	Kent Island Group	-	-	-	-	81	14	2	-	
Near Shore Waters	King Island	727	66	39	2	1,887	83	62	8	
	Lady Julia Percy Island	17	2	-	-	28	2	-	-	
	Laurence Rocks	10	1	-	-	10	1	-	-	
	Martins Island	-	-	-	-	478	2	1	1	
	Moncoeur Islands	381	21	8	-	700	75	30	1	
	Montague Island	-	-	-	-	31	3	0	-	
	Mornington Peninsula	88	6	1	-	117	14	2	-	
	Moyne	80	8	2	-	115	7	1	-	
	Mud Island	23	1	-	-	17	1	-	-	
	Norman Island	104	13	2	-	265	43	6	-	
	Phillip Island	24	5	-	-	123	11	3	-	
	Reid Rock	140	20	3	-	66	5	1	-	
	Rodondo Island	423	22	9	1	733	78	31	1	
	Seal Islands	122	9	2	-	303	35	4	-	
	Shellback Island	50	10	-	-	656	32	4	1	
	Skull Rock	227	20	7	-	217	71	22	-	
	South Gippsland	122	16	4	-	764	64	9	1	
	Surf Coast	144	8	3	-	140	16	3	-	
		Three Hummock Island	18	1	-	-	-	-	-	-
		Warrnambool	16	1	-	-	22	1	-	-
	Wellington	22	1	-	-	245	7	2	-	
State Waters	New South Wales	142	4	2	-	117	10	1	-	
	Tasmania	1,217	80	55	5	2,106	96	86	23	
	Victoria	1,383	77	54	5	1,332	80	66	6	

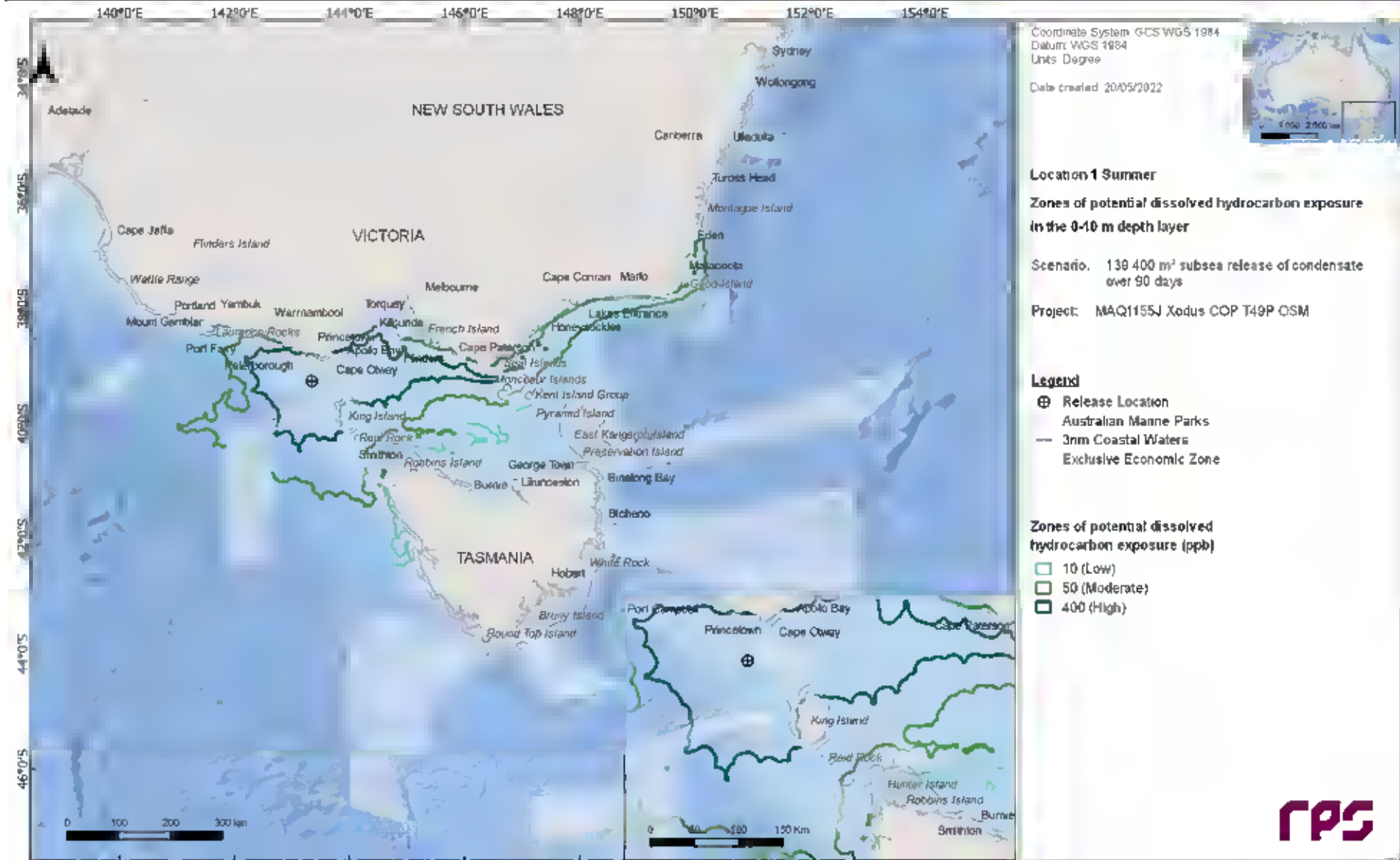


Figure 13.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

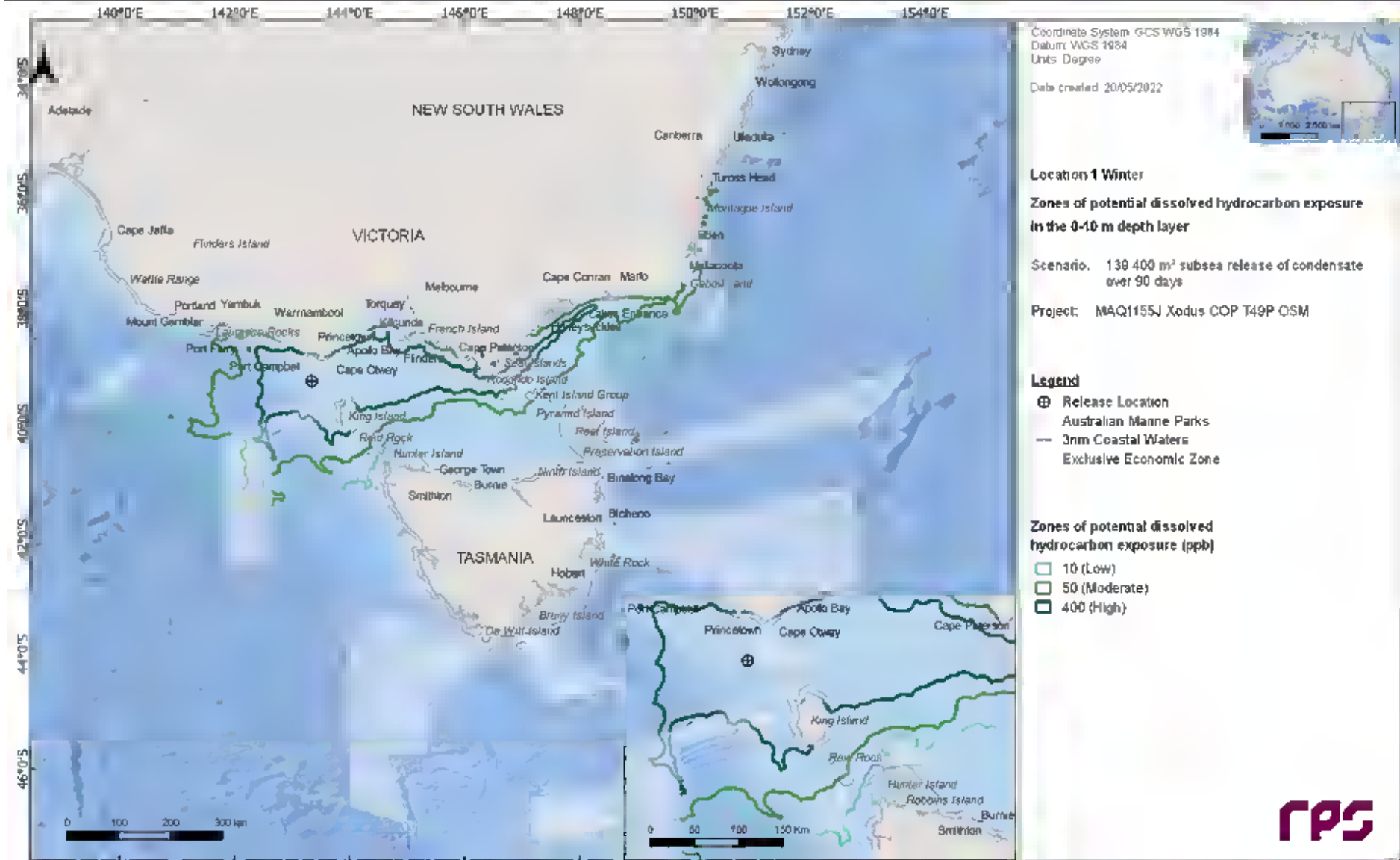


Figure 13.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.2.3.2 Entrained Hydrocarbons

Table 13-8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 13-9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layer, for each season.

Figure 13.8 to Figure 13.7 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer. Extent of the entrained hydrocarbon exposure for each season in the 10 -20 m and 20 – 30 m depth layers is presented in Appendix A.

Table 13-8 Maximum distance and direction by entrained hydrocarbon exposure (0-10m) from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	822	666
	Maximum distance (km) from release location (99 th percentile)	735	650
	Direction	ENE	ENE
Winter	Maximum distance (km) from release location	833	665
	Maximum distance (km) from release location (99 th percentile)	783	649
	Direction	ENE	ENE

Table 13-9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	3,478	100	100	2,964	100	100
	Beagle	286	59	17	297	93	32
	Boags	117	36	3	93	18	-
	East Gippsland	71	12	-	65	42	-
	Flinders	16	1	-	16	6	-
	Franklin	138	54	3	112	26	1
	Nelson	16	3	-	20	6	-
	Zeehan	891	95	74	966	72	44
IBRA	Bateman	28	4	-	32	27	-
	Bridgewater	117	16	2	125	6	5
	East Gippsland Lowlands	55	27	-	84	80	-
	Flinders	306	47	9	320	86	28
	Gippsland Plain	207	65	9	367	98	27
	Glenelg Plain	123	19	2	126	6	5
	Jervis	-	-	-	13	5	-
	King Island	894	92	54	960	98	78
	Otway Plain	582	87	51	572	88	52
	Otway Ranges	576	84	49	408	83	51
	South East Coastal Ranges	35	7	-	34	28	-
	Strzelecki Ranges	107	65	4	172	97	13
	Tasmanian West	42	37	-	12	2	-
Victorian Volcanic Plain	12	3	-	-	-	-	

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	Warrnambool Plain	420	72	24	437	50	24
	Wilson's Promontory	355	65	20	453	94	50
	Batemans Shelf	191	25	5	189	55	3
	Boags	99	43	-	70	15	-
	Central Bass Strait	1,952	100	100	1,823	100	100
	Central Victoria	1,431	100	93	1,533	100	96
	Davey	11	1	-	-	-	-
IMCRA	Flinders	356	67	21	489	94	51
	Franklin	71	50	-	61	17	-
	Otway	11,005	100	100	11,153	100	100
	Twofold Shelf	306	50	9	320	92	24
	Victorian Embayments	160	47	4	155	62	8
	Big Horseshoe Canyon	28	19	-	38	56	-
	Bonney Coast Upwelling	169	29	2	174	13	5
KEF	Canyons on the eastern continental slope	34	5	-	49	18	-
	Shelf rocky reefs	29	8	-	38	32	-
	Upwelling East of Eden	267	34	6	269	83	5
	West Tasmania Canyons	924	94	86	805	47	35
	Bunurong	83	62	-	129	75	2
	Cape Howe	62	26	-	78	80	-
	Churchill Island	95	30	-	109	45	1
	Corner Inlet	12	1	-	12	4	-
	Discovery Bay	34	16	-	38	6	-
	French Island	14	3	-	18	10	-
MNP	Ninety Mile Beach	-	-	-	19	3	-
	Point Addis	124	43	3	170	49	10
	Point Hicks	44	29	-	71	80	-
	Port Phillip Heads	126	36	3	131	43	7
	Twelve Apostles	659	70	24	693	46	25
	Wilson's Promontory	224	65	19	349	94	50
	Beware Reef	19	9	-	21	31	-
MS	Marengo Reefs	557	80	33	409	71	41
	Merri	92	8	-	85	12	-
	Mushroom Reef	163	41	1	148	56	1
	The Arches	154	45	4	159	25	4
	Batemans	32	6	-	38	30	-
MP	Jervis Bay	-	-	-	12	2	-
	Lower South East	11	1	-	-	-	-
NPS4	Bunurong Marine Park	65	56	-	124	68	7

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	Corner Inlet Marine and Coastal Park	64	39	-	53	50	-
	Nooramunga Marine and Coastal Park	12	5	-	16	5	-
	Shallow Inlet Marine and Coastal Park	74	33	-	68	49	-
	Wilsons Promontory Marine Park	168	58	10	380	87	27
	Wilsons Promontory Marine Reserve	210	64	10	352	93	45
NP	Kent Group	94	30	-	99	66	-
	Booderee	-	-	-	10	1	-
NR	Chappell Islands	10	1	-	-	-	-
Ramsar	Corner Inlet	64	39	-	53	50	-
	Gippsland Lakes	-	-	-	13	1	-
	Glenelg Estuary and Discovery Bay Wetlands	13	3	-	13	5	-
	Lavinia	64	37	-	161	66	5
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	96	24	-	89	33	-
	Western Port	93	28	-	90	44	-
	Bell Reef	138	61	2	137	40	2
RSB	Beware Reef	19	9	-	21	31	-
	Bravenes Rock	478	84	55	507	74	38
	Brown Rocks	31	26	-	25	5	-
	Cody Bank	137	78	3	149	99	4
	Cutter Rock	122	52	8	204	90	18
	Endeavour Reef	13	5	-	32	23	-
	New Zealand Star Bank	114	27	3	126	83	3
	Wakitipu Rock	16	5	-	33	27	-
	Warrego Rock	19	5	-	15	6	-
	Wright Rock	15	5	-	45	26	-
Near Shore Waters	Albatross Island	43	40	-	23	6	-
	Anser Island	199	65	14	265	94	49
	Badger Island	11	2	-	5	-	-
	Bass Coast	108	60	1	149	73	8
	Bega Valley	46	23	-	55	76	-
	Big green Island	10	1	-	5	-	-
	Black Pyramid	119	50	3	98	19	-
	Circular Head	34	32	-	34	5	-
	Colac Otway	582	87	51	572	88	52
	Corangamite	372	72	26	432	50	28
	Craggy Island	17	5	-	14	13	-

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Curtis Island	120	47	4	290	86	28
East Gippsland	55	27	-	84	77	-
East Kangaroo Island	10	1	-	5	-	-
Eurobodalla	17	2	-	26	24	-
Flinders Island	11	1	-	7	-	-
Frankston	11	1	-	13	6	-
French Island	70	24	-	73	32	-
Gabo Island	53	23	-	53	80	-
Glenelg	123	19	2	126	6	5
Glennie Group	224	65	15	352	94	46
Goose Island	12	2	-	5	-	-
Greater Geelong	107	34	3	122	44	6
Hogan Island Group	306	43	9	320	84	24
Hunter Island	34	33	-	38	5	-
Huon Valley	11	1	-	3	-	-
Kanowna Island	204	65	20	286	94	50
Kent Island Group	94	30	-	99	63	-
King Island	894	92	56	960	98	78
Lady Julia Percy Island	96	21	-	112	7	3
Laurence Rocks	118	13	2	125	6	5
Martins Island	12	1	-	8	-	-
Moncoeur Islands	355	58	18	307	93	41
Montague Island	28	4	-	32	27	-
Mornington Peninsula	207	56	5	210	64	8
Mount Chappell Island	12	3	-	6	-	-
Moyne	222	39	9	216	23	8
Mud Island	78	22	-	81	29	-
Norman Island	196	63	15	453	93	40
Outer Sister Island	10	1	-	7	-	-
Pasco Group	11	1	-	7	-	-
Phillip Island	148	63	3	168	64	10
Prime Seal Island	12	3	-	7	-	-
Pyramid Island	19	6	-	60	29	-
Reid Rock	214	65	6	194	53	8
Rodondo Island	275	59	18	301	93	44
Seal Islands	121	39	2	119	84	6
Shellback Island	163	58	7	388	90	23
Shoal Haven	-	-	-	12	5	-
Skull Rock	204	65	20	286	94	50
South Gippsland	188	65	13	435	98	41
Surf Coast	207	54	6	183	52	8
Three Hummock Island	23	17	-	20	4	-

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	Warrnambool	128	17	2	118	12	4
	Wellington	16	8	-	18	7	-
	West Coast	42	37	-	12	2	-
	New South Wales state waters	78	27	-	79	80	-
State Waters	South Australia	11	1	-	-	-	-
	Tasmania	1,037	97	68	1,156	100	93
	Victoria	801	92	74	833	100	72

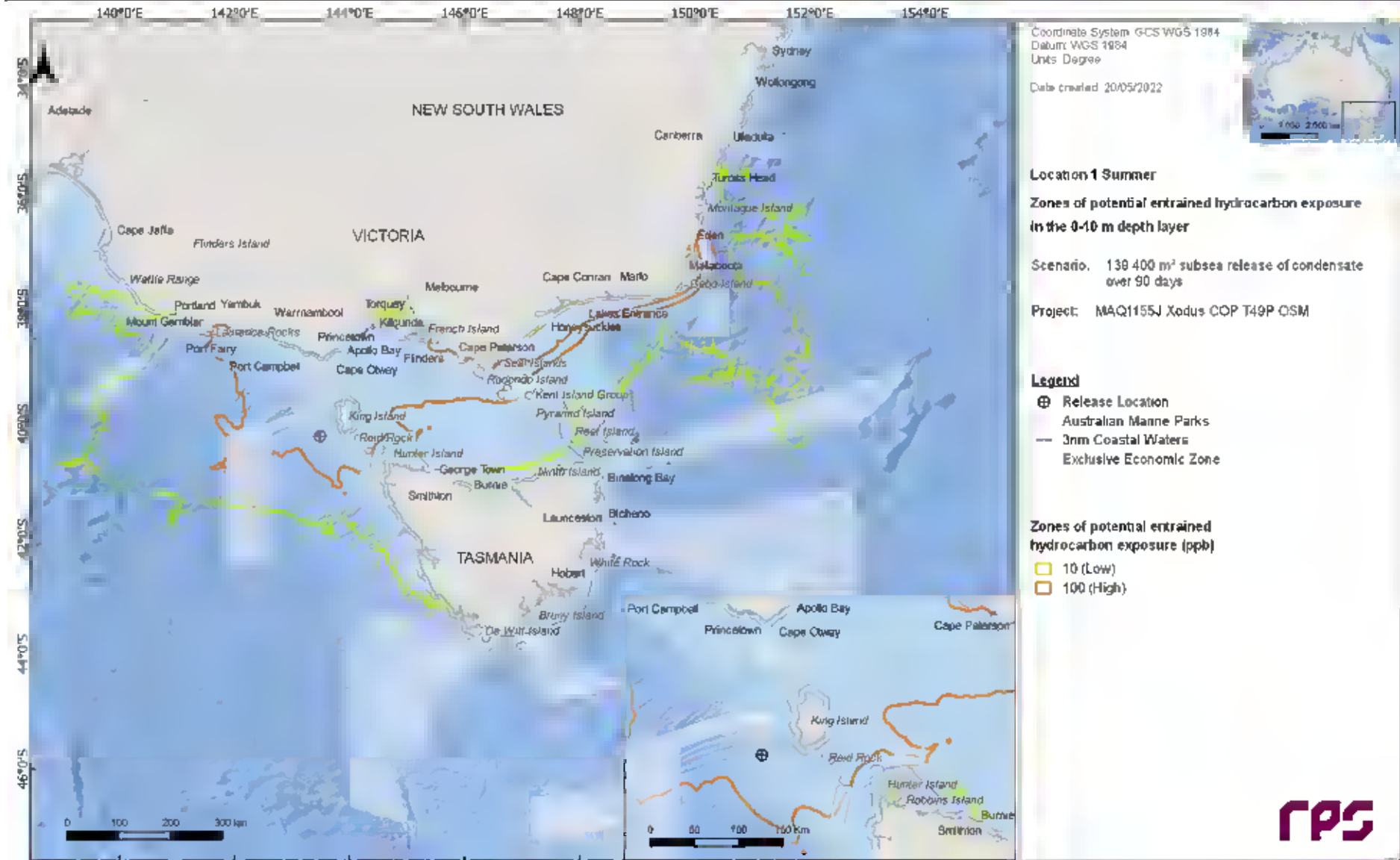


Figure 13.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

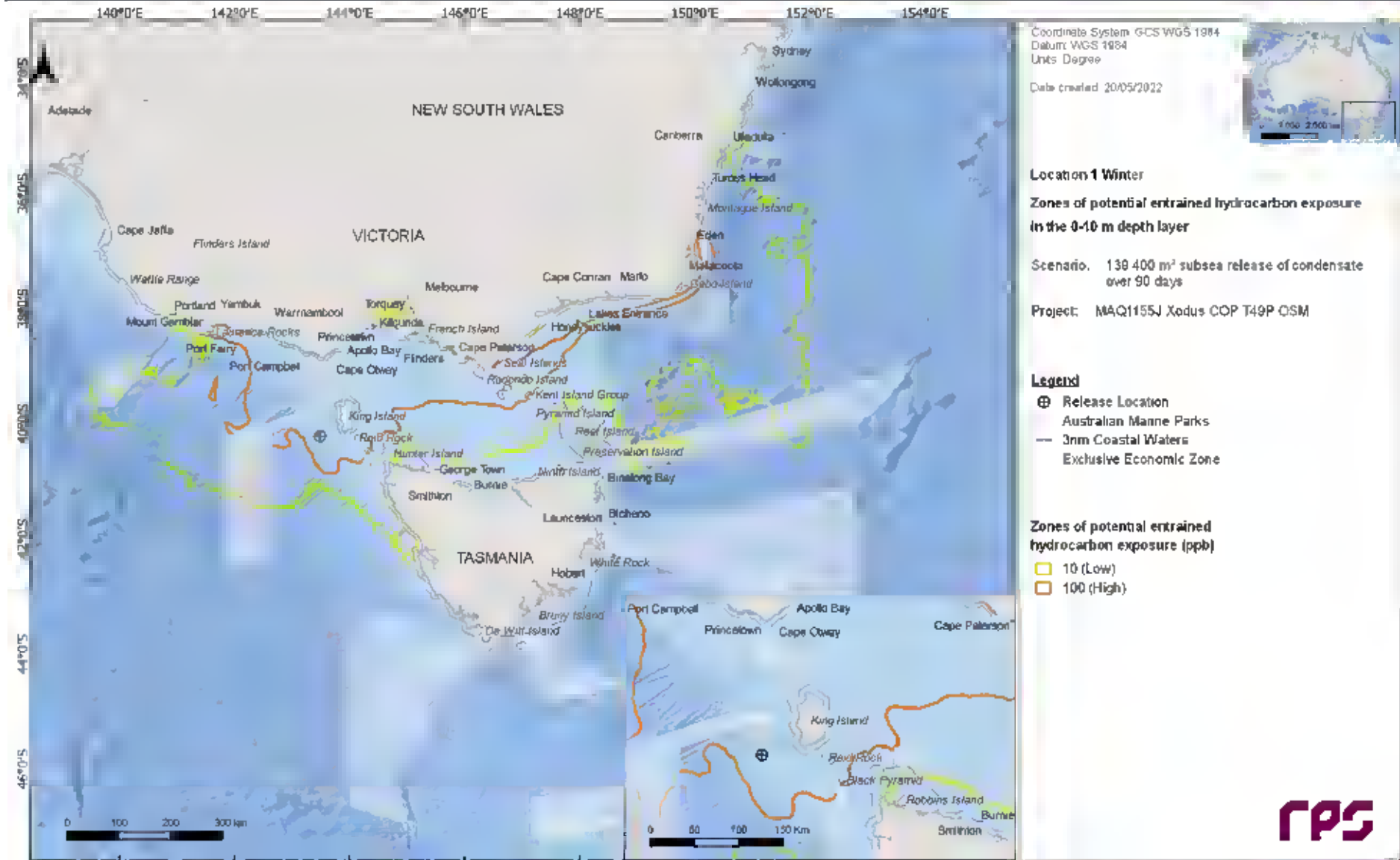


Figure 13.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.3 Deterministic Analysis

13.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore of 20 m³ was identified as run number 43 which commenced during winter conditions, 1 am 23rd June 2010.

Figure 13.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 19.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 120 days are presented in Figure 13.11 and Figure 13.12, respectively.

Figure 13.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 76,470 m³ (~55%) was lost to the atmosphere through evaporation. Approximately, 61,145 m³ (~44%) of the released volume decayed, while approximately 1,740 m³ (~1%) was predicted to remain within the water column and approximately 10 m³ (<0.01%) was present on the shorelines.

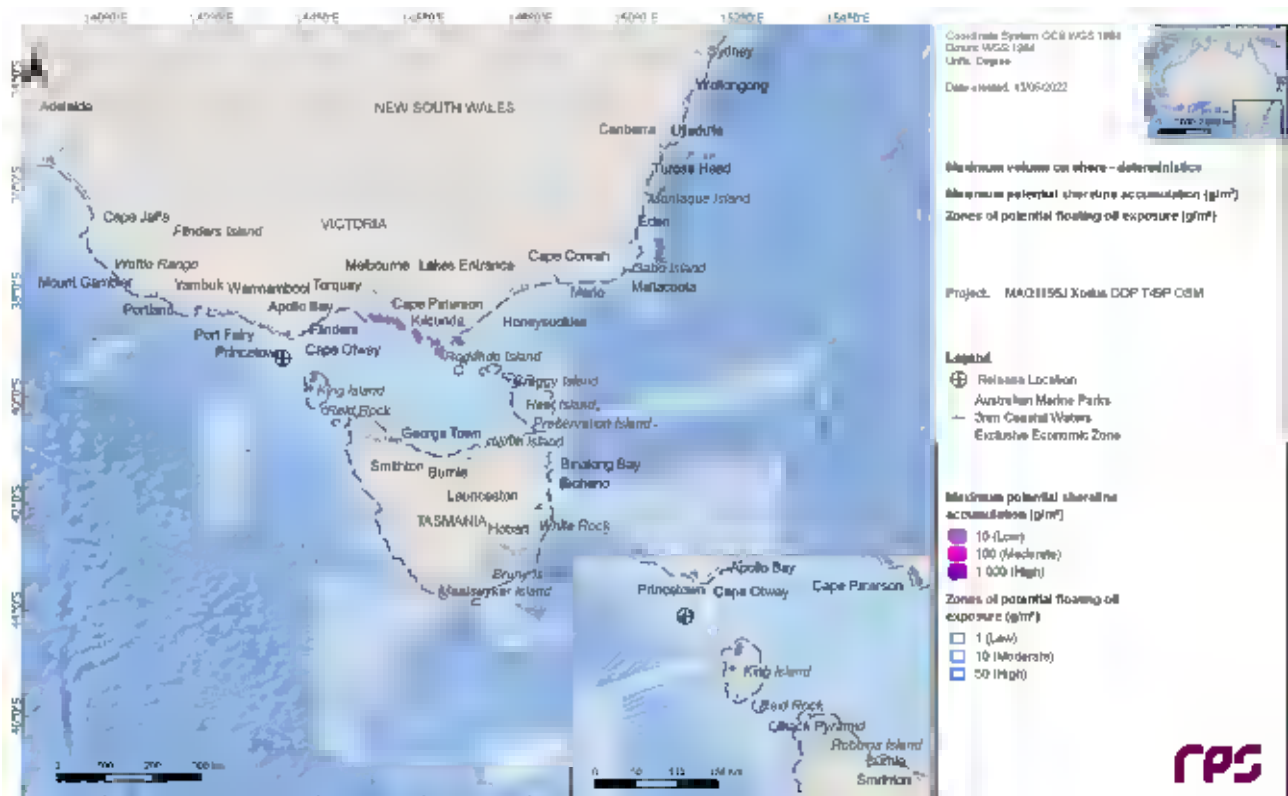


Figure 13.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

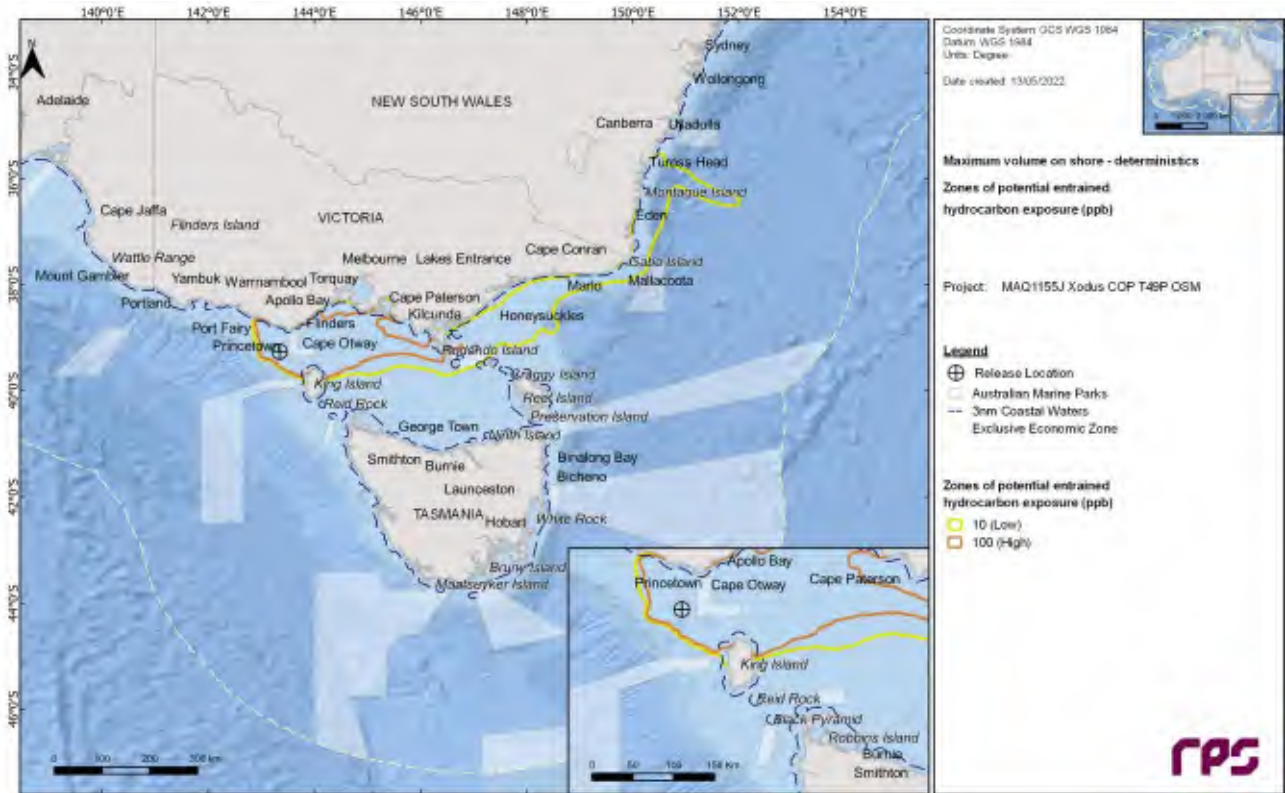


Figure 13.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

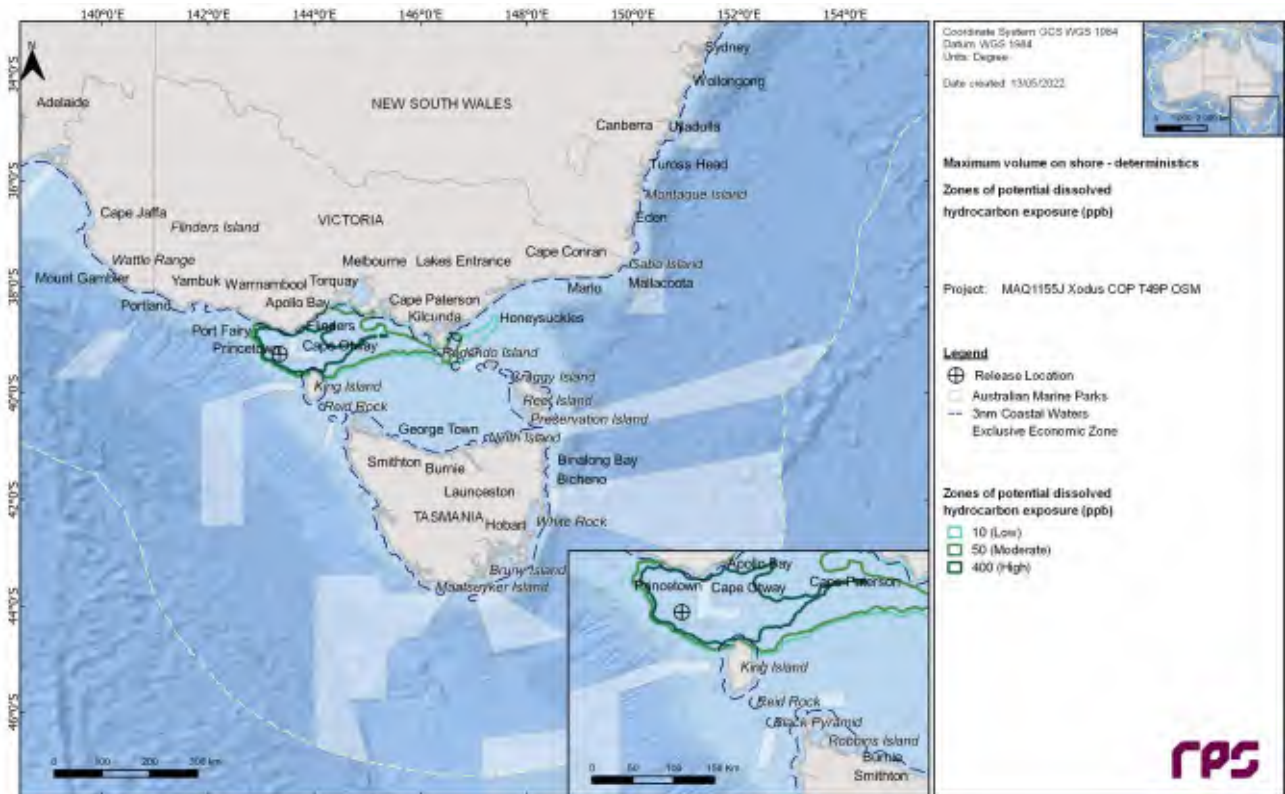


Figure 13.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

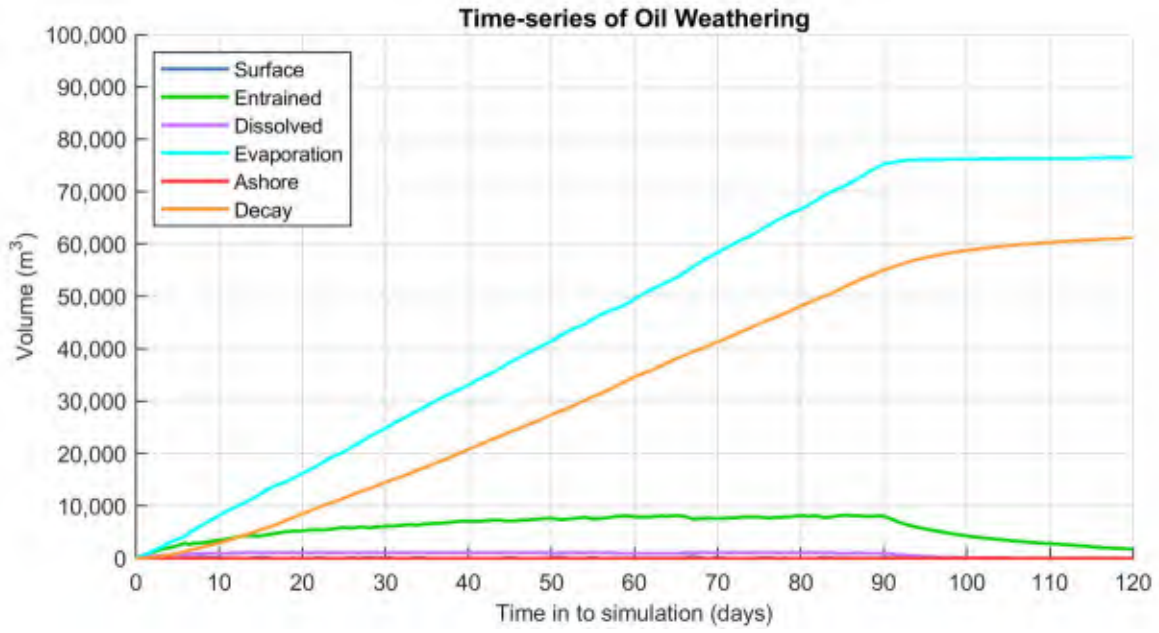


Figure 13.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

14 LOCATION 2 LOWC RESULTS

This scenario examined the potential exposure following a subsea LOWC at Location 2. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 14.1 presents the low threshold EMBA, Section 14.2 shows the seasonal (or stochastic) analysis results, while Section 14.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

14.1 EMBA

Figure 14.1 shows the EMBA for Location 2. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

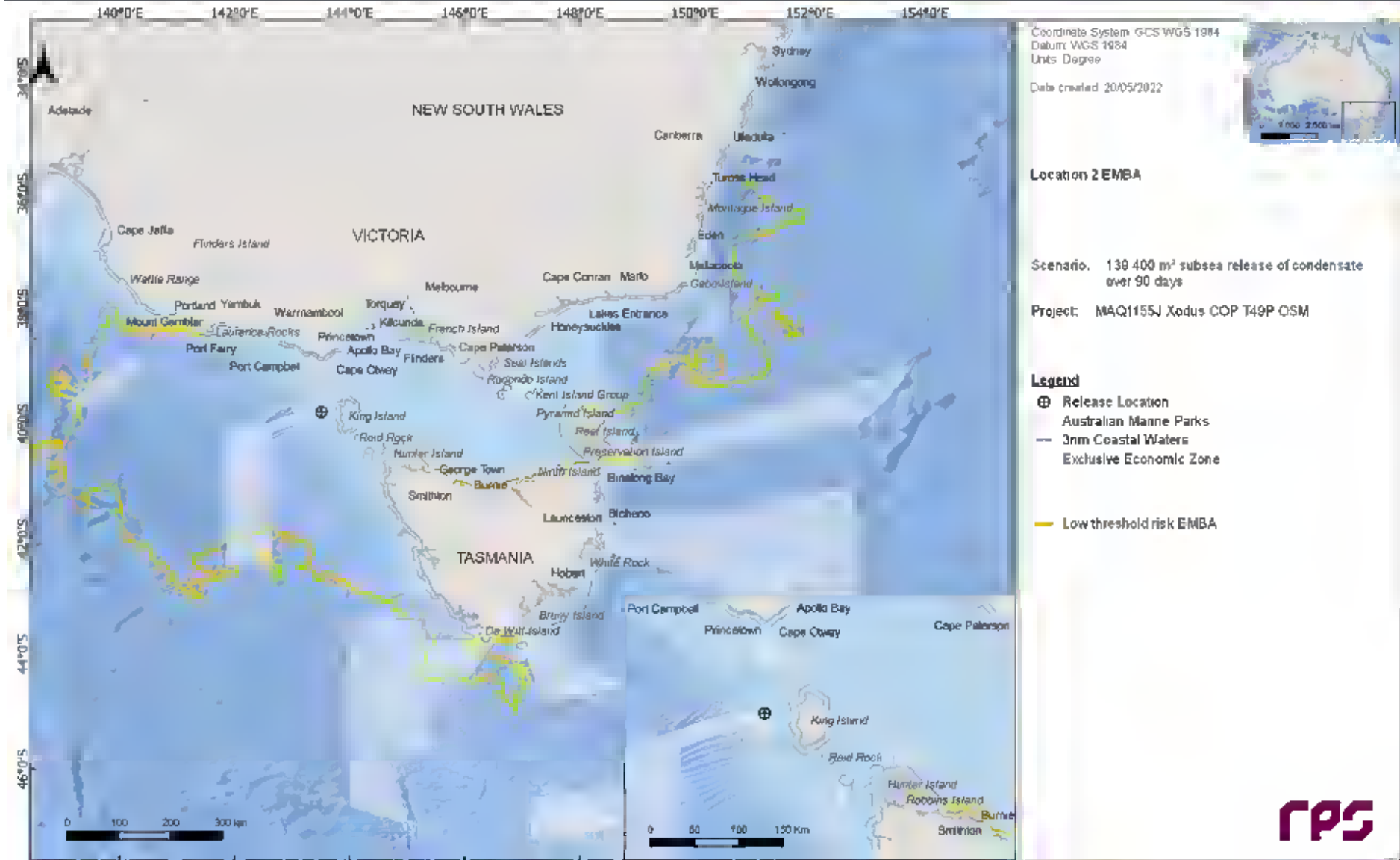


Figure 14.1 Predicted low threshold EMBA from a subsea LOWC at Location 2. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

14.2 Stochastic Analysis

14.2.1 Floating Oil Exposure

Table 14-1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 14-2 summarises the potential floating oil exposure to individual receptors for each season. The exposure by floating oil to BIAs can be found in Appendix A.

Figure 14.2 to Figure 14.3 illustrate the extent of floating oil exposure for each season.

The largest swept area of floating oil exposure at or above the low threshold during winter and summer conditions for a single simulation was 1,278 km² and 1,035 km², respectively.

Table 14-1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	125.7	42.7	0.3
	Maximum distance (km) from release location (99 th percentile)	79.8	9.2	0.3
	Direction	ENE	SE	W
Winter	Maximum distance (km) from release location	147.4	42.7	0.3
	Maximum distance (km) from release location (99 th percentile)	93.2	12.7	0.3
	Direction	NE	SE	W

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Table 14-2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 2 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
AMP	Apollo	7	-	-	20.96	-	-	29	-	-	13.04	-	-
	Zeehan	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
IBRA	King Island	95	5	-	2.29	15.79	-	100	11	-	1.17	21.42	-
IMCRA	Central Bass Strait	44	-	-	8.96	-	-	75	-	-	2.08	-	-
	Otway	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
KEF	West Tasmania Canyons	63	-	-	2.33	-	-	29	-	-	3.92	-	-
Near Shore Waters	King Island	95	5	-	2.29	15.79	-	100	11	-	1.17	21.42	-
	Reid Rock	-	-	-	-	-	-	7	-	-	13.71	-	-
State Waters	Tasmania	99	5	-	1.17	15.79	-	100	11	-	0.92	21.42	-

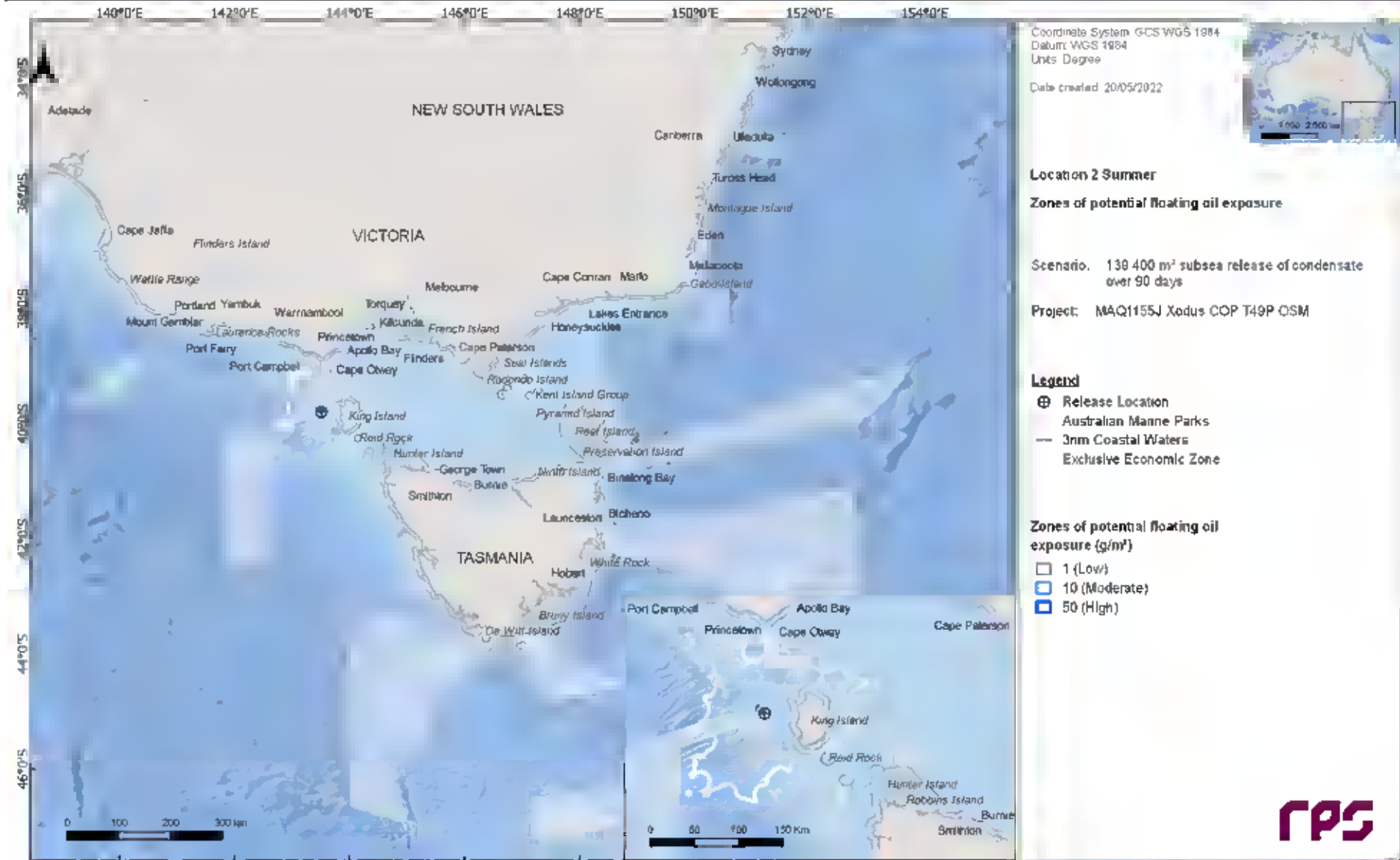


Figure 14.2 Zones of potential floating oil exposure from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

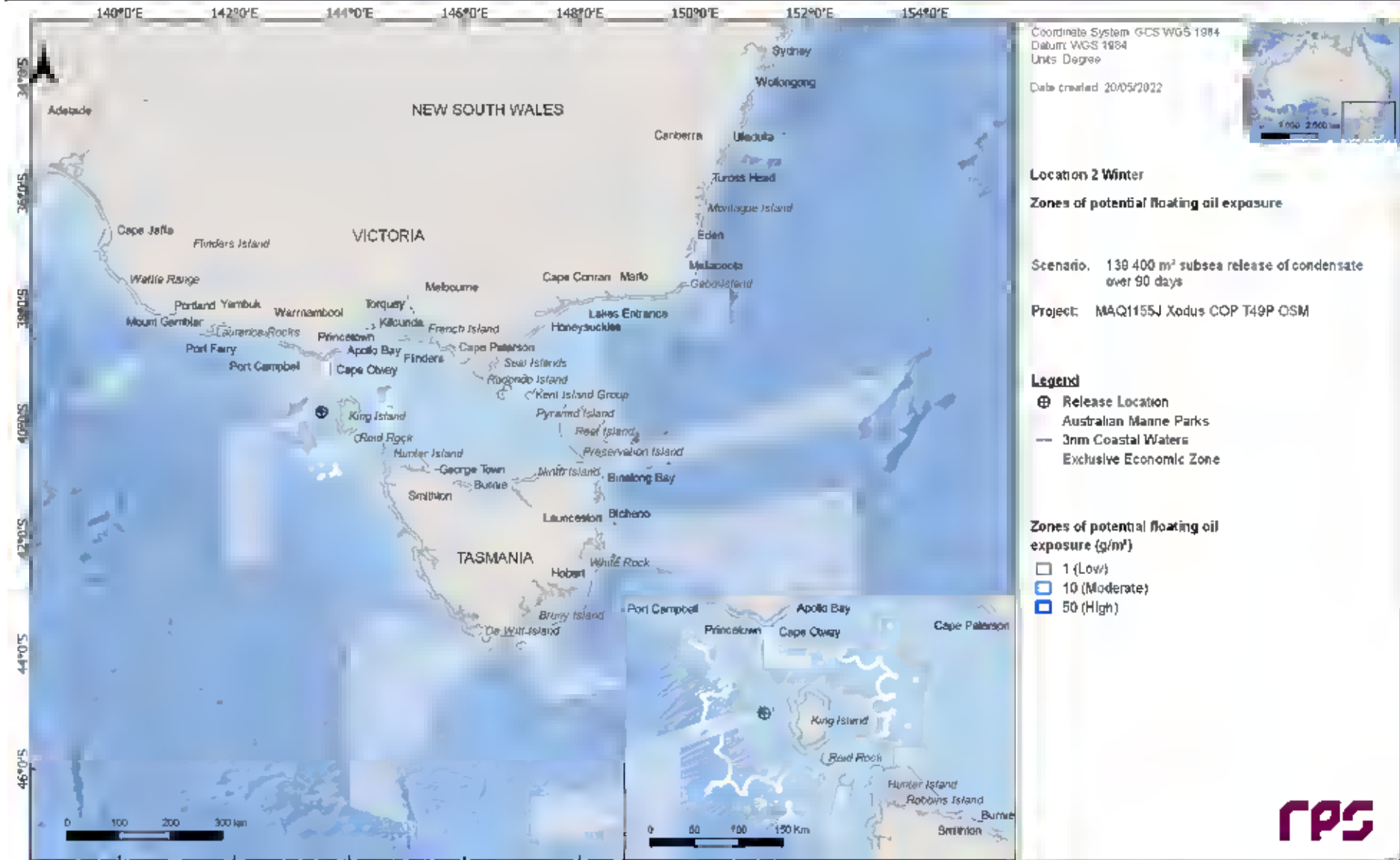


Figure 14.3 Zones of potential floating oil exposure from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.2.2 Shoreline Accumulation

Table 14-3 summarises the predicted accumulation on any shoreline during each season.

Table 14-4 to Table 14-6 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 14.4 and Figure 14.5.

Table 14-3 Summary of accumulation on any shoreline from a subsea LOWC at Location 2 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	100	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	3.88	3.21
Maximum volume of hydrocarbons ashore (m ³)	71.7	196.6
Average volume of hydrocarbons ashore (m ³)	17.8	73.9
Maximum length of the shoreline at 10 g/m² (km)	112	131
Average shoreline length (km) at 10 g/m² (km)	64.9	90
Maximum length of the shoreline at 100 g/m² (km)	35	50
Average shoreline length (km) at 100 g/m² (km)	12.3	28.9
Maximum length of the shoreline at 1,000 g/m² (km)	1	4
Average shoreline length (km) at 1,000 g/m² (km)	1	1.5

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Table 14-4 Summary of oil accumulation on individual shoreline sectors from a subsea LOWC at Location 2 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)			
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High	
Albatross Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anser Island	1	-	-	82.25	-	-	3	14	< 0.1	< 0.1	1	-	-	1	-	-	
Bega Valley	5	-	-	72.17	-	-	3	42	< 0.1	< 0.1	2.7	-	-	3.8	-	-	
Circular Head	17	-	-	35.75	-	-	1	81	< 0.1	0.5	2.8	-	-	9.6	-	-	
Colac Otway	2	-	-	30.21	-	-	1	27	< 0.1	< 0.1	2.9	-	-	4.8	-	-	
Corangamite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Curtis Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
East Gippsland	3	-	-	75.54	-	-	2	14	< 0.1	< 0.1	1	-	-	1	-	-	
Gabo Island	2	-	-	94.71	-	-	3	14	< 0.1	< 0.1	1	-	-	1	-	-	
Glennie Group	6	-	-	75.79	-	-	2	24	< 0.1	< 0.1	1.4	-	-	3.8	-	-	
Greater Geelong	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hogan Island Group	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hunter Island	3	-	-	69.04	-	-	1	31	< 0.1	< 0.1	1.9	-	-	2.9	-	-	
Huon Valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Kanowna Island	2	-	-	89.92	-	-	2	18	< 0.1	< 0.1	1	-	-	1	-	-	
Kent Island Group	4	-	-	95.75	-	-	1	49	< 0.1	0.5	3.3	-	-	3.8	-	-	
King Island	100	96	22	3.88	5.04	16.08	37	3,581	17.7	71.6	58.9	11.7	1	88.9	33.5	1	
Moncoeur Islands	1	-	-	103.79	-	-	1	22	< 0.1	< 0.1	1	-	-	1	-	-	
Mornington Peninsula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Norman Island	6	-	-	57.63	-	-	4	55	< 0.1	0.2	1.6	-	-	2.9	-	-	
Phillip Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Reid Rock	25	-	-	12.38	-	-	5	53	< 0.1	< 0.1	1.6	-	-	2.9	-	-	
Seal Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

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Shellback Island	3	-	-	55.08	-	-	6	22	< 0.1	< 0.1	1	-	-	1	-	-
Skull Rock	2	-	-	89.92	-	-	2	18	< 0.1	< 0.1	1	-	-	1	-	-
South Gippsland	6	-	-	53.67	-	-	2	73	< 0.1	1.6	19	-	-	34.4	-	-
Surf Coast	2	-	-	33.58	-	-	1	16	< 0.1	< 0.1	1.4	-	-	1.9	-	-
Three Hummock Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wellington	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Coast	9	-	-	42.21	-	-	1	43	< 0.1	1.5	4.8	-	-	18.2	-	-
Anglesea	1	-	-	38.04	-	-	1	10	< 0.1	< 0.1	1	-	-	1	-	-
Apollo Bay	1	-	-	30.21	-	-	1	16	< 0.1	< 0.1	1	-	-	1	-	-
Bega Valley	5	-	-	72.17	-	-	3	42	< 0.1	< 0.1	2.7	-	-	3.8	-	-
Cape Howe / Mallacoota	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cape Liptrap (NW)	5	-	-	53.67	-	-	3	73	< 0.1	0.8	9.6	-	-	13.4	-	-
Cape Otway West	1	-	-	76.92	-	-	1	27	< 0.1	< 0.1	4.8	-	-	4.8	-	-
Cape Patton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croajingolong (East)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croajingolong (West)	2	-	-	104.83	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
Golden Beach	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lorne	2	-	-	33.58	-	-	1	16	< 0.1	< 0.1	1	-	-	1	-	-
McLoughlins Beach	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moonlight Head	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mornington Peninsula (SW)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point Hicks	1	-	-	75.54	-	-	2	11	< 0.1	< 0.1	1	-	-	1	-	-
Port Phillip (Queenscliff)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Port Phillip (Sorrento Shore)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seaspray	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sydenham Inlet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waratah Bay	4	-	-	53.92	-	-	1	37	< 0.1	< 0.1	2.6	-	-	4.8	-	-
Wilson's Promontory (East)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

REPORT

Wilsons Promontory (West)	6	-	-	53.83	-	-	2	65	< 0.1	0.8	9.2	-	-	17.2	-	-
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REPORT

Table 14-5 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 2 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Albatross Island	1	-	-	84.21	-	-	2	12	< 0.1	< 0.1	1	-	-	1	-	-
Anser Island	16	-	-	18.88	-	-	8	74	< 0.1	< 0.1	1.3	-	-	1.9	-	-
Bega Valley	2	-	-	46.04	-	-	1	51	< 0.1	< 0.1	2.4	-	-	2.9	-	-
Circular Head	24	2	-	18.63	64.92	-	2	103	< 0.1	1.4	7.3	1	-	13.4	1	-
Colac Otway	4	-	-	22.96	-	-	2	21	< 0.1	< 0.1	2.2	-	-	4.8	-	-
Corangamite	1	-	-	65.92	-	-	3	12	< 0.1	< 0.1	1	-	-	1	-	-
Curtis Island	8	-	-	17.71	-	-	3	27	< 0.1	< 0.1	1.6	-	-	1.9	-	-
East Gippsland	7	-	-	26.92	-	-	2	41	< 0.1	0.3	8.1	-	-	9.6	-	-
Gabo Island	3	-	-	48.71	-	-	3	23	< 0.1	< 0.1	1	-	-	1	-	-
Glennie Group	16	-	-	19.38	-	-	4	50	< 0.1	0.2	3.1	-	-	6.7	-	-
Greater Geelong	1	-	-	111.33	-	-	< 1	11	< 0.1	< 0.1	1	-	-	1	-	-
Hogan Island Group	9	-	-	26.83	-	-	2	24	< 0.1	< 0.1	1.4	-	-	2.9	-	-
Hunter Island	17	-	-	23.92	-	-	2	75	< 0.1	0.3	3.5	-	-	10.5	-	-
Huon Valley	2	-	-	72.25	-	-	< 1	13	< 0.1	< 0.1	1.4	-	-	1.9	-	-
Kanowna Island	13	-	-	19	-	-	5	88	< 0.1	0.2	1.7	-	-	2.9	-	-
Kent Island Group	35	5	-	18.38	41.79	-	4	111	< 0.1	1.7	3.6	1	-	8.6	1	-
King Island	100	100	80	3.21	4.04	9.75	81	4,630	73.7	196.3	75.8	27.6	1.4	97.5	47.8	3.8
Moncoeur Islands	9	-	-	16.17	-	-	3	19	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Mornington Peninsula	3	-	-	66.54	-	-	1	22	< 0.1	< 0.1	1	-	-	1	-	-
Norman Island	15	1	-	29.33	115.88	-	6	104	< 0.1	1.3	2.2	1	-	3.8	1	-
Phillip Island	3	-	-	45.88	-	-	1	13	< 0.1	< 0.1	1	-	-	1	-	-
Reid Rock	21	-	-	11.17	-	-	5	32	< 0.1	< 0.1	2	-	-	2.9	-	-
Seal Islands	6	-	-	48.54	-	-	3	38	< 0.1	< 0.1	2.7	-	-	3.8	-	-

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Shellback Island	6	-	-	29.79	-	-	6	21	< 0.1	< 0.1	1	-	-	1	-	-
Skull Rock	12	-	-	19	-	-	5	88	< 0.1	0.2	1.3	-	-	1.9	-	-
South Gippsland	26	1	-	19.25	53.17	-	3	108	< 0.1	3.5	6.3	1	-	29.6	1	-
Surf Coast	3	-	-	65.46	-	-	2	15	< 0.1	< 0.1	2.2	-	-	4.8	-	-
Three Hummock Island	2	-	-	54.96	-	-	2	15	< 0.1	< 0.1	1	-	-	1	-	-
Wellington	3	-	-	57.42	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
West Coast	22	-	-	22.79	-	-	2	59	< 0.1	0.5	8.8	-	-	23.9	-	-
Anglesea	1	-	-	91.54	-	-	2	11	< 0.1	< 0.1	1	-	-	1	-	-
Apollo Bay	2	-	-	90.88	-	-	2	13	< 0.1	< 0.1	1.4	-	-	1.9	-	-
Bega Valley	2	-	-	46.04	-	-	1	51	< 0.1	< 0.1	2.4	-	-	2.9	-	-
Cape Howe / Mallacoota	6	-	-	27.46	-	-	3	41	< 0.1	0.3	4.5	-	-	5.7	-	-
Cape Liptrap (NW)	7	-	-	26.96	-	-	3	55	< 0.1	0.4	4.9	-	-	12.4	-	-
Cape Otway West	1	-	-	22.96	-	-	2	21	< 0.1	< 0.1	4.8	-	-	4.8	-	-
Cape Patton	1	-	-	63.83	-	-	2	13	< 0.1	< 0.1	1	-	-	1	-	-
Croajingolong (East)	5	-	-	27.79	-	-	2	22	< 0.1	< 0.1	2.7	-	-	4.8	-	-
Croajingolong (West)	6	-	-	26.92	-	-	2	23	< 0.1	0.3	1.8	-	-	3.8	-	-
Golden Beach	1	-	-	70.79	-	-	2	14	< 0.1	< 0.1	1	-	-	1	-	-
Lorne	3	-	-	65.46	-	-	3	15	< 0.1	< 0.1	1.9	-	-	3.8	-	-
McLoughlins Beach	1	-	-	102.46	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
Moonlight Head	1	-	-	65.92	-	-	3	12	< 0.1	< 0.1	1	-	-	1	-	-
Mornington Peninsula (SW)	2	-	-	91.08	-	-	1	22	< 0.1	< 0.1	1	-	-	1	-	-
Point Hicks	3	-	-	26.96	-	-	2	23	< 0.1	< 0.1	1.3	-	-	1.9	-	-
Port Phillip (Queenscliff)	1	-	-	111.33	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
Port Phillip (Sorrento Shore)	1	-	-	66.54	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
Seaspray	1	-	-	57.42	-	-	2	10	< 0.1	< 0.1	1	-	-	1	-	-
Sydenham Inlet	2	-	-	44.63	-	-	< 1	13	< 0.1	< 0.1	1	-	-	1	-	-
Waratah Bay	6	-	-	28.54	-	-	2	43	< 0.1	< 0.1	1.3	-	-	2.9	-	-
Wilson's Promontory (East)	5	-	-	61.54	-	-	2	18	< 0.1	< 0.1	1	-	-	1	-	-

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Wilsons Promontory (West)	25	1	-	19.25	53.17	-	4	108	< 0.1	3	4.6	1	-	14.3	1	-
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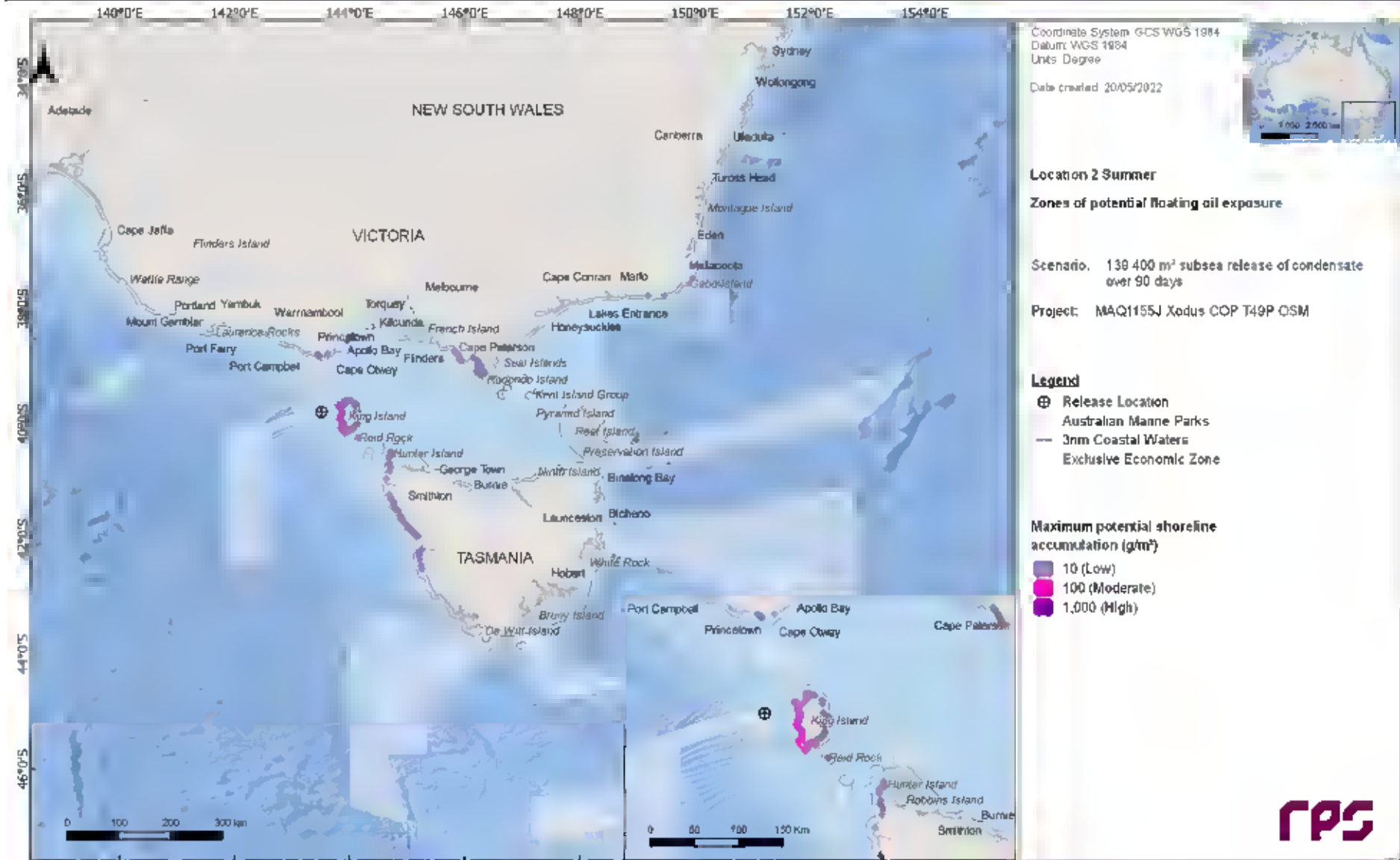


Figure 14.4 Maximum potential shoreline loading from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

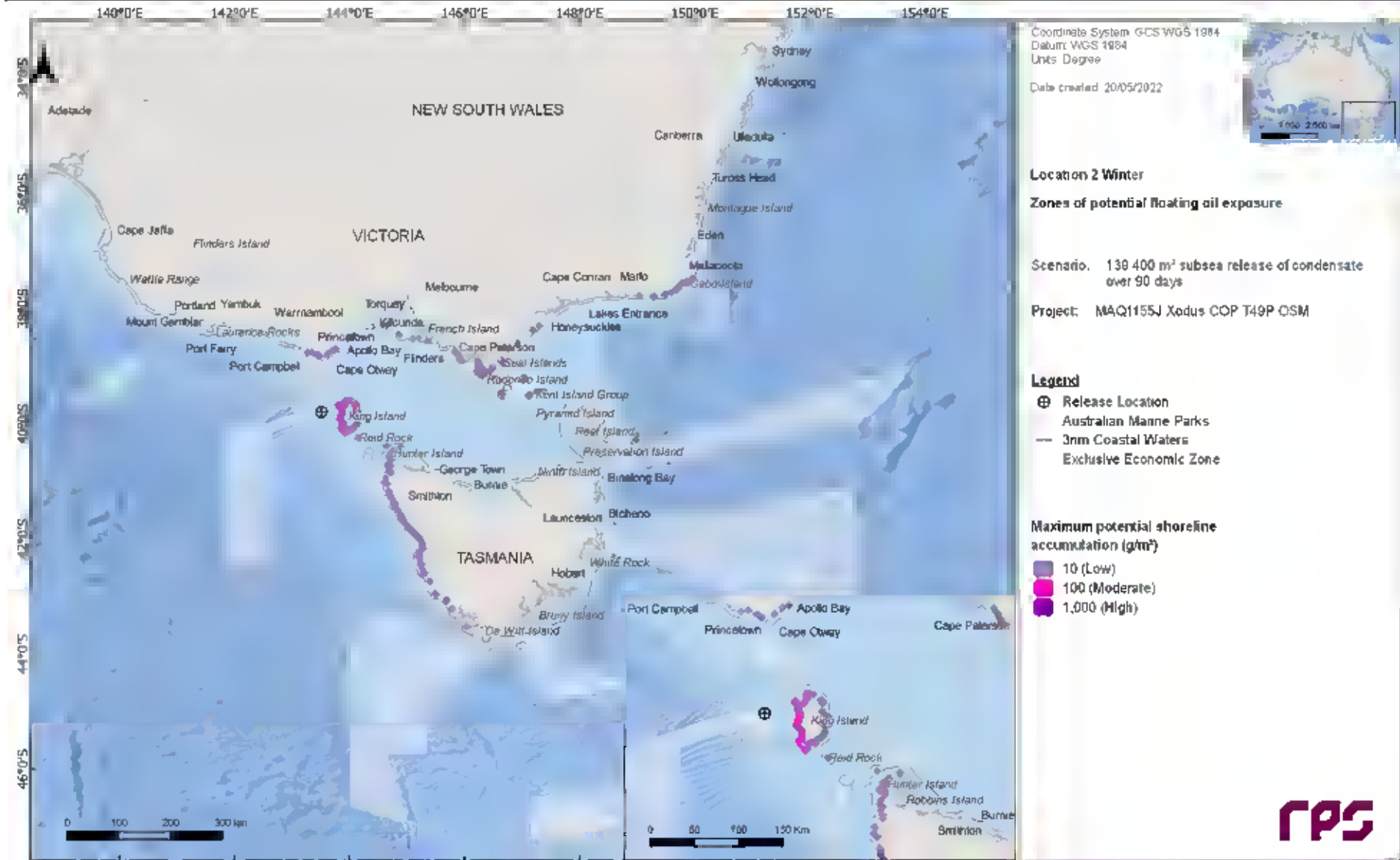


Figure 14.5 Maximum potential shoreline loading from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.2.3 In-water exposure

14.2.3.1 Dissolved Hydrocarbons

Table 14-6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 14-7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m depth layer for each threshold and season.

Figure 14.6 and Figure 14.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers. Figures showing the extent of dissolved hydrocarbon exposure in the 10-20 m, 20 – 30 m and 30 – 50 m depth layers for each season are presented in Appendix A.

Table 14-6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	590	461	229
	Maximum distance (km) from release location (99 th percentile)	435	304	146
	Direction	ENE	ENE	ENE
Winter	Maximum distance (km) from release location	703	483	313
	Maximum distance (km) from release location (99 th percentile)	530	337	163
	Direction	ENE	ENE	ENE

Table 14-7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Mod	High		Low	Mod	High	
AMP	Apollo	2,096	50	31	8	1,800	82	54	9
	Beagle	188	10	5	-	352	33	7	-
	Boags	181	23	4	-	176	17	4	-
	Franklin	622	63	22	2	573	42	12	1
	Nelson	19	1	-	-	14	1	-	-
	Tasman Fracture	-	-	-	-	11	1	-	-
	Zeehan	7,248	100	100	100	9,003	100	100	100
IBRA	East Gippsland Lowlands	17	1	-	-	42	2	-	-
	Flinders	200	7	2	-	178	29	4	-
	Gippsland Plain	58	3	1	-	45	8	-	-
	King Island	3,459	100	100	85	4,540	100	100	100
	Otway Plain	30	3	-	-	40	4	-	-
	Otway Ranges	63	2	1	-	50	2	-	-
	Strzelecki Ranges	76	2	1	-	44	8	-	-
	Tasmanian West	60	6	1	-	89	7	1	-
	Warrnambool Plain	13	1	-	-	-	-	-	-
	Wilsons Promontory	130	5	2	-	173	28	4	-
IMCRA	Batemans Shelf	-	-	-	-	18	1	-	-
	Boags	123	22	3	-	99	17	3	-
	Central Bass Strait	3,540	93	80	12	2,656	100	96	37
	Central Victoria	661	15	6	1	769	28	15	2
	Davey	20	1	-	-	14	1	-	-
	Flinders	396	11	6	-	527	45	12	1
	Franklin	623	66	24	1	701	33	13	1
	Otway	7,872	100	100	100	9,003	100	100	100
	Twofold Shelf	200	9	3	-	475	20	4	1
	Victorian Embayments	15	1	-	-	14	1	-	-
KEF	Upwelling East of Eden	-	-	-	-	77	1	1	-
	West Tasmania Canyons	115	4	1	-	91	6	1	-
MNP	Bunurong	5,000	96	87	51	1,980	61	49	12
	Cape Howe	42	2	-	-	28	2	-	-
	Corner Inlet	-	-	-	-	23	2	-	-
	Ninety Mile Beach	-	-	-	-	149	1	1	-
	Point Addis	-	-	-	-	30	1	-	-
	Point Hicks	-	-	-	-	16	1	-	-

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	Wilsons Promontory	15	1	-	-	18	2	-	-
MS	Mushroom Reef	21	4	-	-	193	19	2	-
	Bunurong Marine Park	16	1	-	-	92	6	1	-
	Corner Inlet Marine and Coastal Park	46	2	-	-	11	1	-	-
NPS4	Nooramunga Marine and Coastal Park	-	-	-	-	77	1	1	-
	Shallow Inlet Marine and Coastal Park	-	-	-	-	26	2	-	-
	Wilsons Promontory Marine Park	-	-	-	-	16	1	-	-
	Wilsons Promontory Marine Reserve	14	1	-	-	121	6	1	-
NP	Kent Group	10	1	-	-	74	12	1	-
Ramsar	Corner Inlet	-	-	-	-	65	2	1	-
	Lavinia	468	48	15	1	716	80	38	1
	Bell Reef	492	83	49	1	824	78	40	2
	Brown Rocks	20	4	-	-	26	9	-	-
	Cody Bank	74	4	1	-	74	16	1	-
	Cutter Rock	56	6	2	-	66	24	2	-
RSB	Endeavour Reef	16	1	-	-	14	1	-	-
	New Zealand Star Bank	11	1	-	-	14	1	-	-
	Wakitipu Rock	-	-	-	-	22	2	-	-
	Warrego Rock	11	1	-	-	-	-	-	-
	Wright Rock	-	-	-	-	13	1	-	-
	Albatross Island	64	13	1	-	55	6	1	-
	Anser Island	16	2	-	-	87	13	1	-
	Bass Coast	46	2	-	-	28	1	-	-
	Bega Valley	-	-	-	-	42	2	-	-
	Black Pyramid	372	57	15	-	292	30	9	-
	Circular Head	73	9	1	-	122	9	2	-
	Colac Otway	63	3	1	-	50	4	-	-
	Curtis Island	119	7	1	-	116	29	3	-
	East Gippsland	17	1	-	-	31	1	-	-
	Glennie Group	16	4	-	-	74	14	1	-
Near Shore Waters	Hogan Island Group	200	7	2	-	178	20	4	-
	Hunter Island	36	4	-	-	113	7	1	-
	Kanowna Island	17	2	-	-	110	16	2	-
	Kent Island Group	39	1	-	-	47	8	-	-
	King Island	3,459	100	100	85	4,540	100	100	99
	Maatsuyker Island	-	-	-	-	12	1	-	-
	Moncoeur Islands	65	4	1	-	138	28	4	-
	Mornington Peninsula	10	1	-	-	30	1	-	-
	Moyne	13	1	-	-	-	-	-	-
	Norman Island	13	1	-	-	40	7	-	-
	Phillip Island	58	2	1	-	21	1	-	-

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	Pyramid Island	-	-	-	-	21	1	-	-
	Reid Rock	1,196	88	64	4	2,655	91	70	14
	Robbins Island	20	1	-	-	-	-	-	-
	Rodondo Island	58	5	1	-	173	28	4	-
	Round Top Island	-	-	-	-	11	1	-	-
	Seal Islands	11	1	-	-	40	4	-	-
	Shellback Island	11	1	-	-	23	4	-	-
	Skull Rock	13	3	-	-	91	17	2	-
	South Gippsland	76	3	1	-	167	17	2	-
	Surf Coast	38	1	-	-	26	2	-	-
	Three Hummock Island	18	2	-	-	35	4	-	-
	Wellington	-	-	-	-	35	2	-	-
	West Coast	60	6	1	-	89	7	1	-
	New South Wales	-	-	-	-	42	2	-	-
State Waters	Tasmania	6,498	100	100	97	5,688	100	100	100
	Victoria	209	8	3	-	280	32	6	-

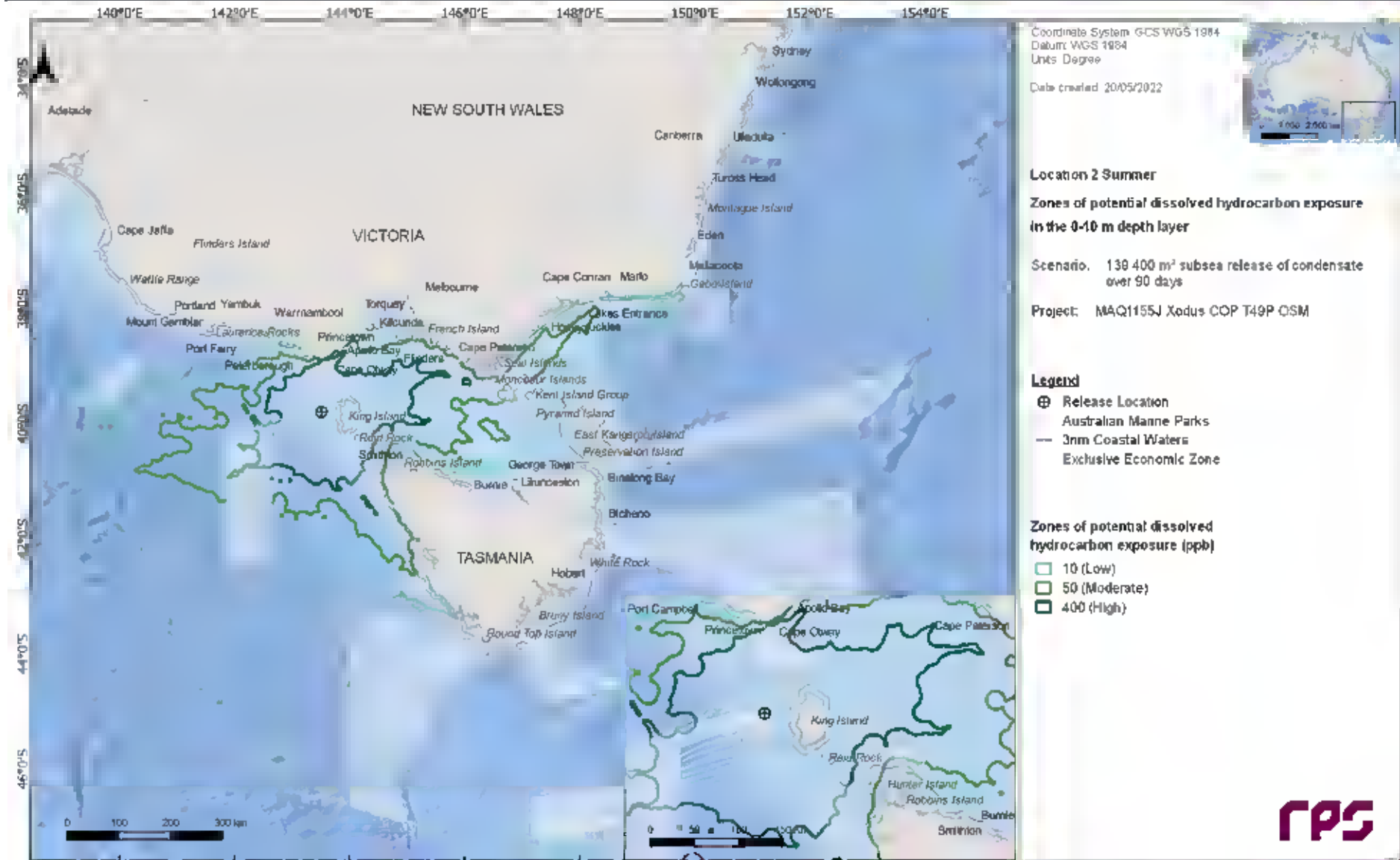


Figure 14.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

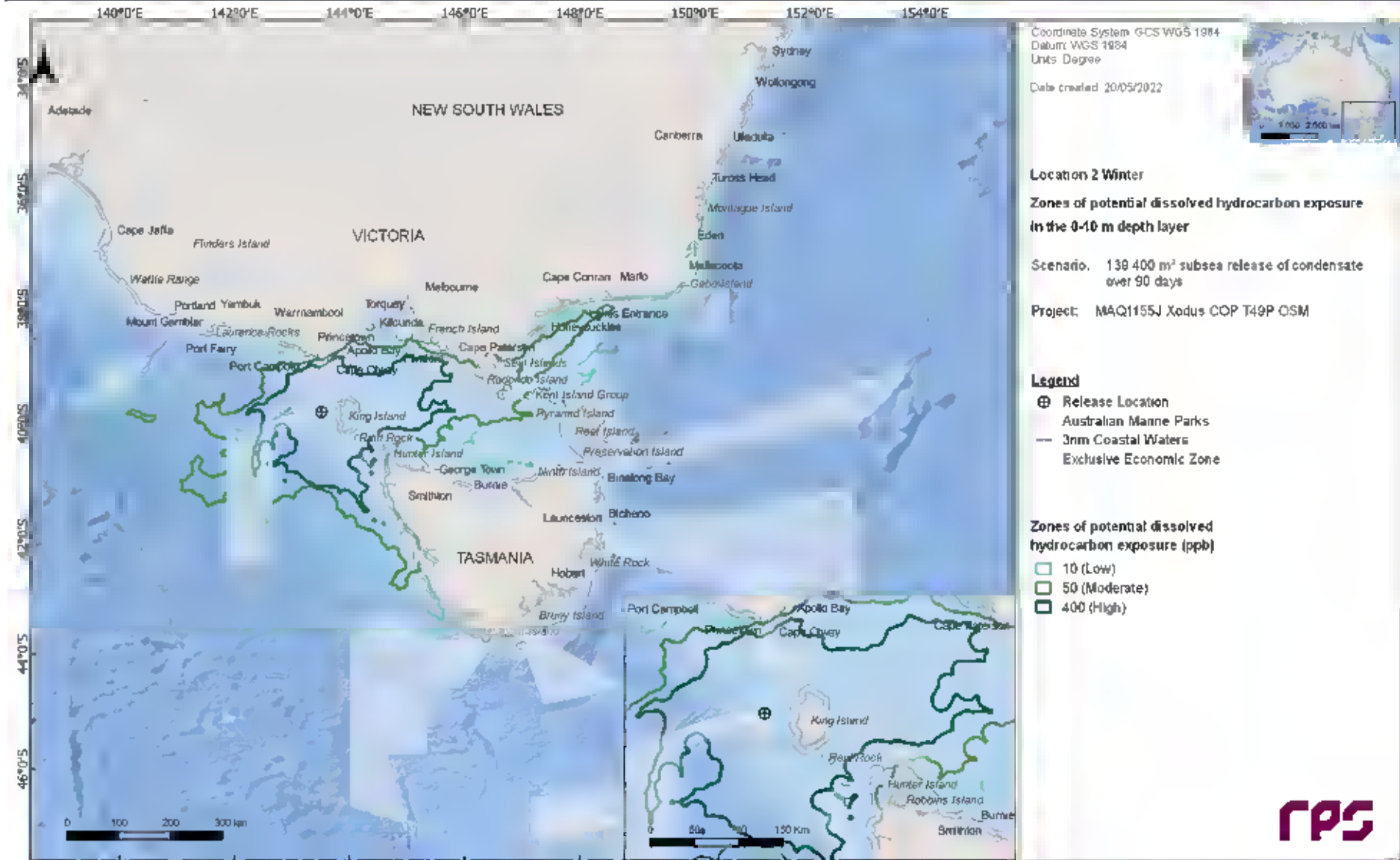


Figure 14.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.2.3.2 Entrained Hydrocarbons

Table 14-8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 14-9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layer, for each season.

Figure 14.8 and Figure 14.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer. Extent of the entrained hydrocarbon exposure for each season in the 10 -20 m and 20 – 30 m depth layers is presented in Appendix A.

Table 14-8 Maximum distance and direction by entrained hydrocarbon exposure (0-10m) from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	831	583
	Maximum distance (km) from release location (99 th percentile)	698	334
	Direction	ENE	ENE
Winter	Maximum distance (km) from release location	831	579
	Maximum distance (km) from release location (99 th percentile)	755	325
	Direction	ENE	ENE

Table 14-9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter				
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure			
		Low	High		Low	High		
AMP	Apollo	905	94	48	972	99	72	
	Beagle	206	43	5	188	86	8	
	Boags	269	84	12	257	91	16	
	East Gippsland	30	7	-	28	9	-	
	Flinders	14	4	-	11	1	-	
	Franklin	348	99	41	315	84	18	
	Huon	12	2	-	-	-	-	
	Nelson	50	5	-	63	2	-	
	Tasman Fracture	18	2	-	35	6	-	
	Zeehan	12,031	100	100	12,738	100	100	
CA	Arthur Bay	12	2	-	11	1	-	
	Bateman	12	3	-	18	13	-	
	Bridgewater	24	3	-	22	3	-	
	East Gippsland Lowlands	58	17	-	53	35	-	
	Flinders	211	37	5	169	86	2	
	Gippsland Plain	159	22	3	143	40	5	
	Glenelg Plain	28	3	-	30	3	-	
	King Island	2,694	100	100	2,939	100	100	
	IBRA	Otway Plain	158	21	1	157	22	1
		Otway Ranges	79	14	-	76	20	-
South East Coastal Ranges		-	-	-	14	3	-	
Strzelecki Ranges		133	21	3	109	41	1	
Tasmanian South East		15	5	-	14	1	-	
Tasmanian Southern Ranges		11	2	-	-	-	-	
Tasmanian West		133	61	7	118	37	4	

REPORT

	Warrnambool Plain	51	8	-	60	4	-
	Wilson's Promontory	189	38	4	154	82	13
IMCRA	Batemans Shelf	75.3	6	-	32.5	2	-
	Boags	4392.6	42	18	3439.9	63	32
	Bruny	563.0	13	6	740.8	76	23
	Central Bass Strait	23.2	1	-	11.8	2	-
	Central Victoria	30	12	-	31	22	-
	Davey	214	84	7	200	83	13
	Flinders	11	1	-	-	-	-
	Franklin	1,054	100	85	1,309	100	100
	Freycinet	422	40	6	419	71	24
	Otway	28	20	-	86	9	-
	Twofold Shelf	211	49	6	188	89	13
	Victorian Embayments	52	8	-	42	13	-
	KEF	Big Horseshoe Canyon	17	5	-	26	19
Bonney Coast Upwelling		62	3	-	71	4	-
Canyons on the eastern continental slope		19	3	-	28	11	-
Seamounts South and east of Tasmania		-	-	-	27	6	-
Shelf rocky reefs		18	3	-	25	14	-
Upwelling East of Eden		120	23	4	110	55	1
West Tasmania Canyons		1,631	99	94	1,400	80	57
Bunurong		104	14	2	90	28	-
MNP	Cape Howe	47	17	-	41	27	-
	Churchill Island	18	7	-	17	10	-
	Ninety Mile Beach	11	2	-	14	4	-
	Point Addis	44	9	-	49	8	-
	Point Hicks	43	19	-	49	45	-
	Port Phillip Heads	39	8	-	47	8	-
	Twelve Apostles	27	10	-	31	4	-

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	Wilson's Promontory	152	38	3	154	72	13
	Batemans	14	3	-	21	17	-
	Beware Reef	17	9	-	22	9	-
	Marengo Reefs	38	13	-	43	18	-
MS	Merri	20	3	-	27	3	-
	Mushroom Reef	20	4	-	31	8	-
	The Arches	13	3	-	15	3	-
NP	Kent Group	61	30	-	100	74	1
	Bunurong Marine Park	72	11	-	63	20	-
	Corner Inlet Marine and Coastal Park	60	8	-	52	10	-
	Nooramunga Marine and Coastal Park	-	-	-	13	4	-
NPS4	Shallow Inlet Marine and Coastal Park	55	4	-	46	9	-
	Wilson's Promontory Marine Park	167	20	3	143	39	5
	Wilson's Promontory Marine Reserve	151	32	3	149	49	8
NR	Chappell Islands	30	5	-	23	2	-
	Corner Inlet	60	8	-	52	10	-
	Gippsland Lakes	11	2	-	19	6	-
	Lavinia	436	92	19	136	100	10
Ramsar	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	26	8	-	30	8	-
	Western Port	20	7	-	21	9	-
	Bell Reef	401	99	78	440	99	72
	Beware Reef	17	9	-	22	9	-
	Bravenes Rock	102	13	1	108	13	1
RSB	Brown Rocks	73	56	-	81	36	-
	Cody Bank	90	29	-	80	37	-
	Cutter Rock	102	35	1	108	84	1
	Endeavour Reef	26	10	-	25	28	-

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	New Zealand Star Bank	94	23	-	87	40	-
	Wakitipu Rock	27	7	-	41	34	-
	Warrego Rock	33	6	-	25	11	-
	Wright Rock	25	11	-	31	37	-
	Albatross Island	91	72	-	119	60	2
	Anser Island	110	35	2	142	59	12
	Badger Island	33	5	-	29	2	-
	Bass Coast	80	12	-	65	23	-
	Bega Valley	27	16	-	30	21	-
	Big green Island	21	5	-	18	2	-
	Black Pyramid	285	99	34	274	86	9
	Boxen Island	25	5	-	20	2	-
	Cape Barren Osland	21	5	-	17	2	-
	Chalky Island	19	5	-	16	2	-
	Circular Head	83	62	-	104	43	1
	Clarke Island	21	5	-	16	2	-
	Colac Otway	158	21	1	157	22	1
	Corangamite	47	8	-	57	4	-
	Craggy Island	30	6	-	23	10	-
	Curtis Island	211	37	5	169	86	2
	De Witt Island	14	5	-	-	-	-
	East Gippsland	56	17	-	51	35	-
	East Kangaroo Island	24	5	-	23	2	-
	Eurobodalla	-	-	-	15	5	-
	Flinders Island	20	5	-	18	2	-
	French Island	13	3	-	12	6	-
	Gabo Island	58	17	-	56	22	-
	Glenelg	28	3	-	30	3	-
	Glennie Group	152	37	3	154	60	8
	Goose Island	36	5	-	32	2	-
	Greater Geelong	36	8	-	44	8	-
	Hogan Island Group	146	32	4	142	79	2
	Hunter Island	97	63	-	103	47	1

Near
Shore
Waters

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Huon Valley	29	19	-	47	9	-
Inner Sister Island	23	5	-	15	3	-
Kanowna Island	106	38	2	150	65	13
Kent Island Group	61	29	-	100	75	1
King Island	2,540	100	100	2,939	100	100
Lady Julia Percy Island	62	3	-	66	3	-
Laurence Rocks	30	3	-	36	3	-
Maatsuyker Island	17	9	-	-	-	-
Martins Island	13	3	-	-	-	-
Mewstone	16	2	-	-	-	-
Moncoeur Islands	70	32	-	125	82	2
Montague Island	12	3	-	18	13	-
Mornington Peninsula	39	10	-	47	10	-
Mount Chappell Island	25	5	-	25	2	-
Moyne	51	6	-	60	3	-
Mud Island	23	2	-	27	8	-
Ninth Island	18	5	-	14	1	-
Norman Island	189	29	3	153	43	9
Outer Sister Island	22	5	-	13	3	-
Pasco Group	18	5	-	14	2	-
Phillip Island	47	13	-	42	14	-
Preservation Island	21	5	-	16	2	-
Prime Seal Island	26	5	-	22	2	-
Pyramid Island	27	19	-	44	54	-
Reef Island	20	5	-	22	2	-
Reid Rock	574	100	77	967	100	89
Robbins Island	10	-	-	15	5	-
Rodondo Island	66	36	-	132	74	3
Round Top Island	15	2	-	-	-	-
Seal Islands	31	11	-	78	36	-
Shellback Island	160	20	3	138	37	5
Skull Rock	98	38	-	156	66	13
South Gippsland	176	33	4	153	65	5

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	Surf Coast	40	9	-	38	8	-
	Three Hummock Island	59	53	-	65	40	-
	Warrnambool	24	3	-	28	3	-
	Wellington	14	6	-	16	6	-
	West Coast	133	61	7	118	35	4
State Waters	New South Wales	27	15	-	30	25	-
	Tasmania	2,975	100	100	2,939	100	100
	Victoria	189	39	4	181	82	13

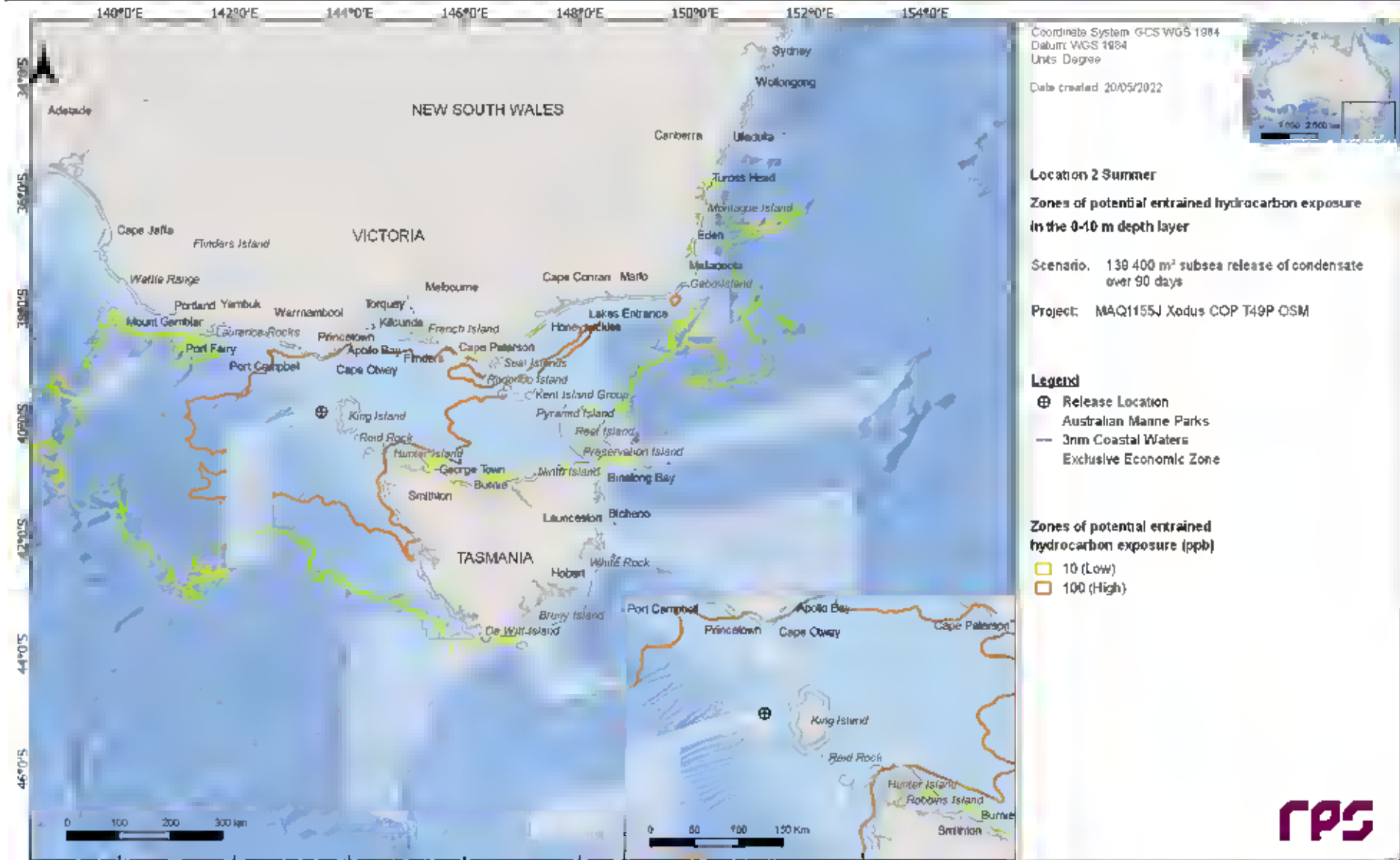


Figure 14.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

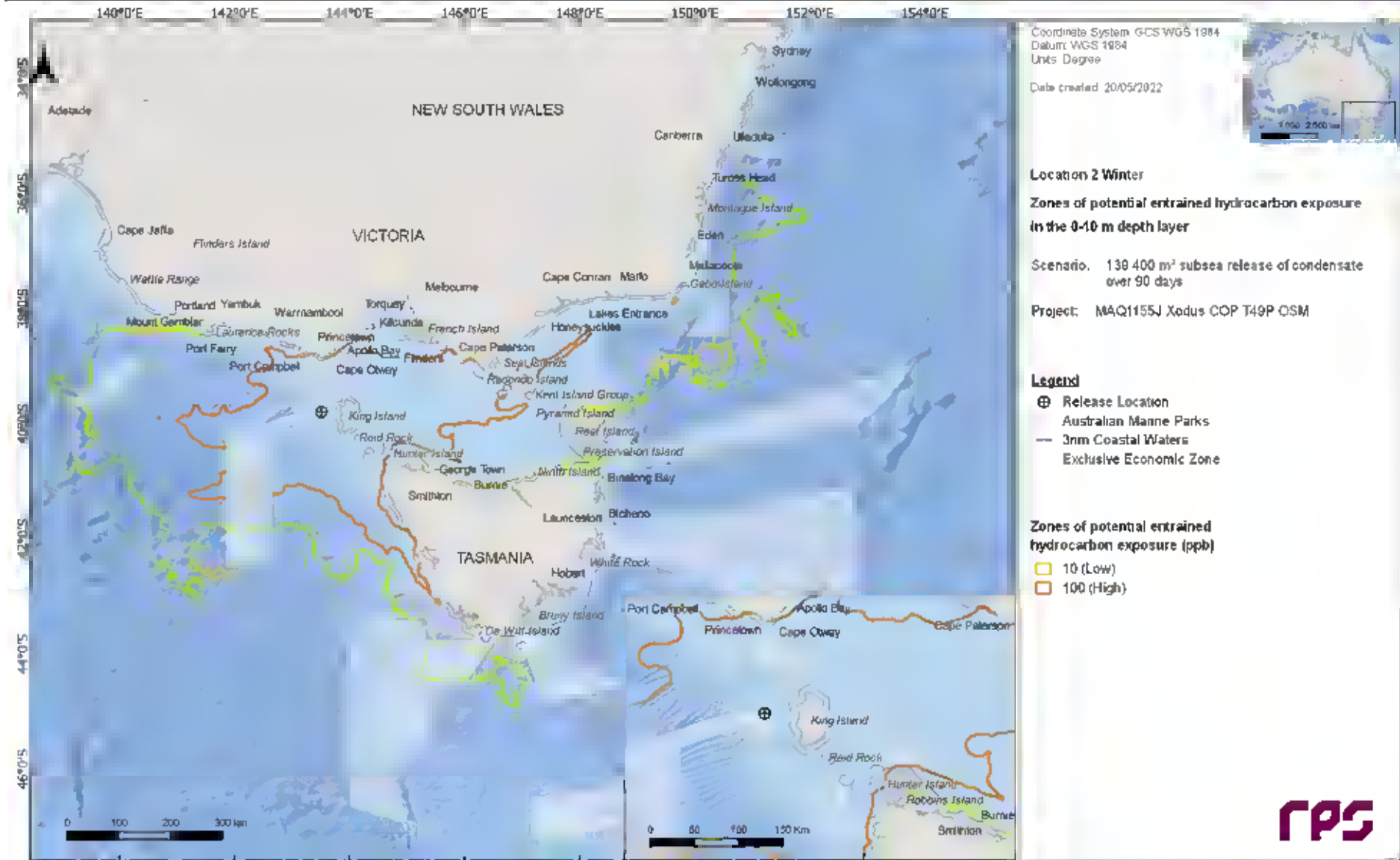


Figure 14.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.3 Deterministic Analysis

14.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore of 196.6 m³ was identified as run number 79 which commenced during winter conditions, 4 pm 23rd June 2012.

Figure 14.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). The initial shoreline accumulation occurred on day 6 of the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 14.11 and Figure 14.12, respectively.

Figure 14.13 presents the fates and weathering graph for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 78,400 m³ (~56%) was lost to the atmosphere through evaporation. Approximately, 59,000 m³ (~42%) of the released volume decayed, while approximately 1,800 m³ (~1%) was predicted to remain within the water column and approximately 194 m³ (<1%) remained on shorelines.

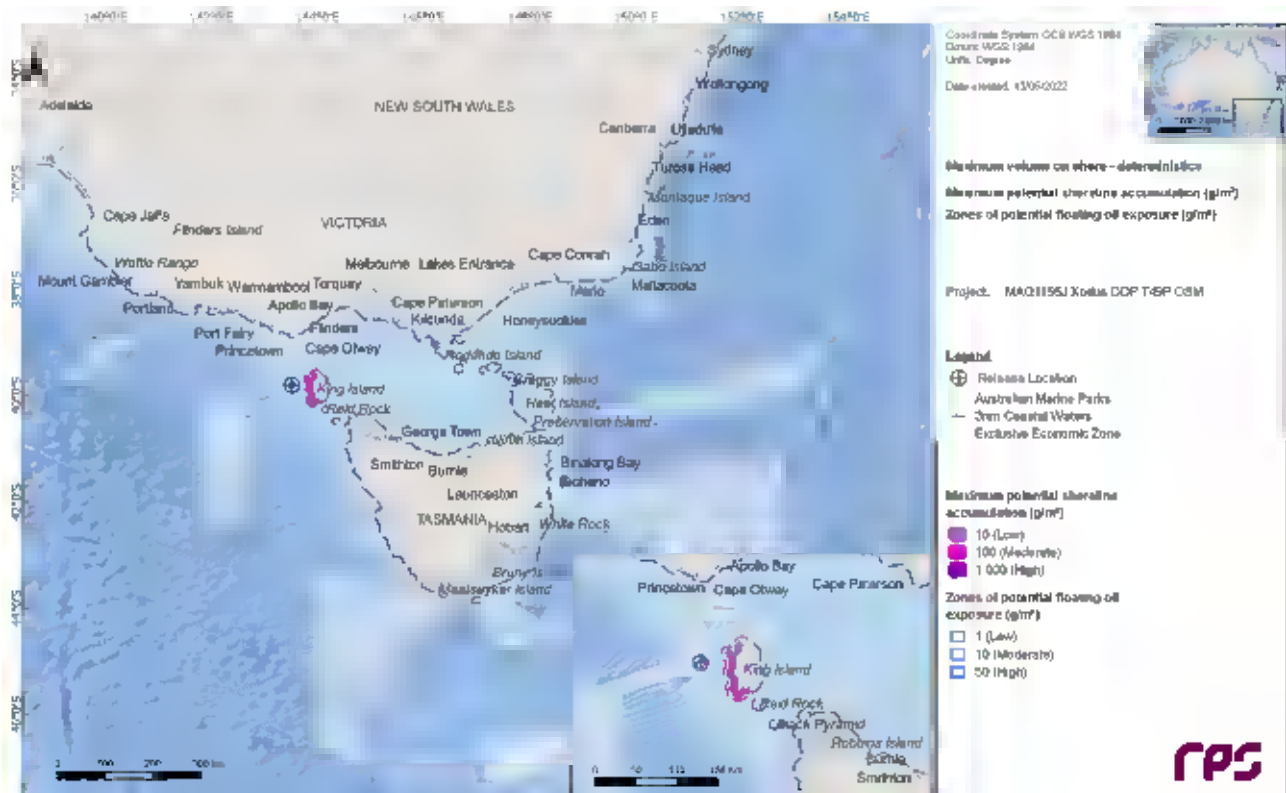


Figure 14.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

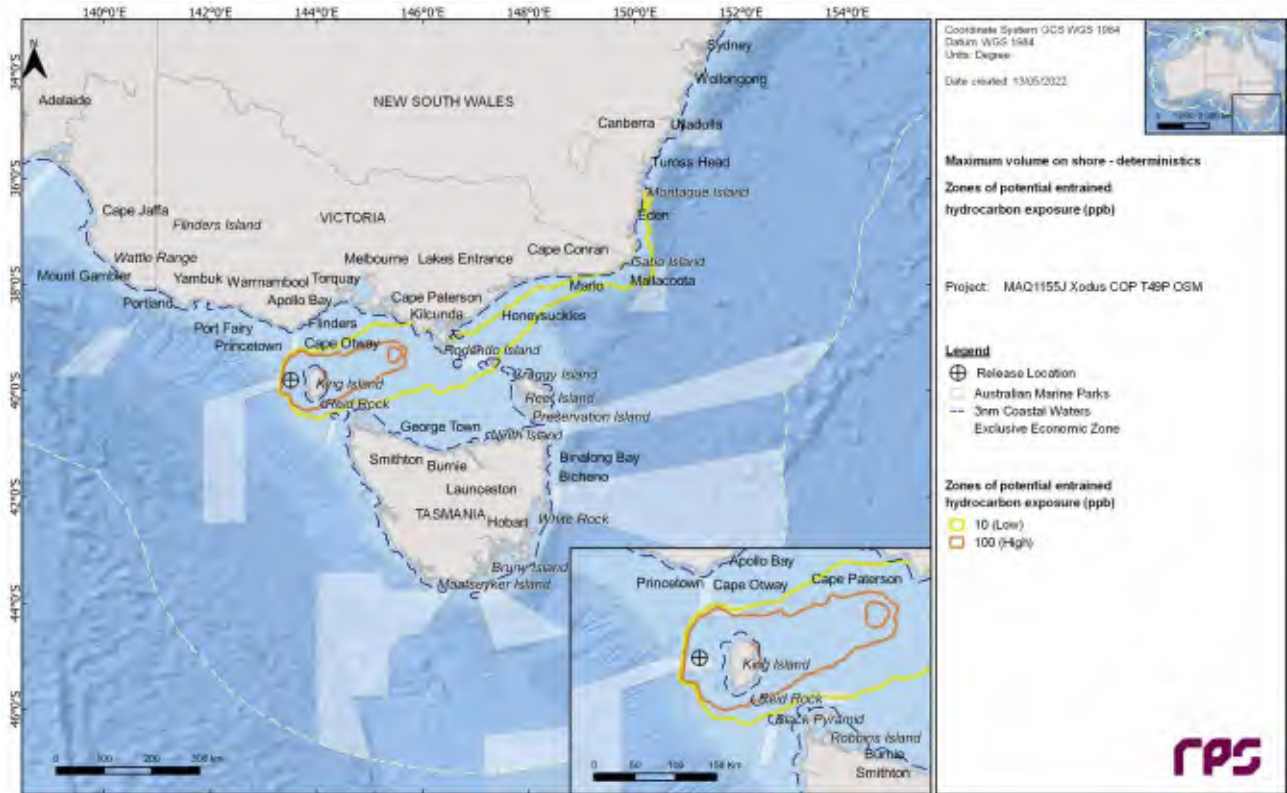


Figure 14.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

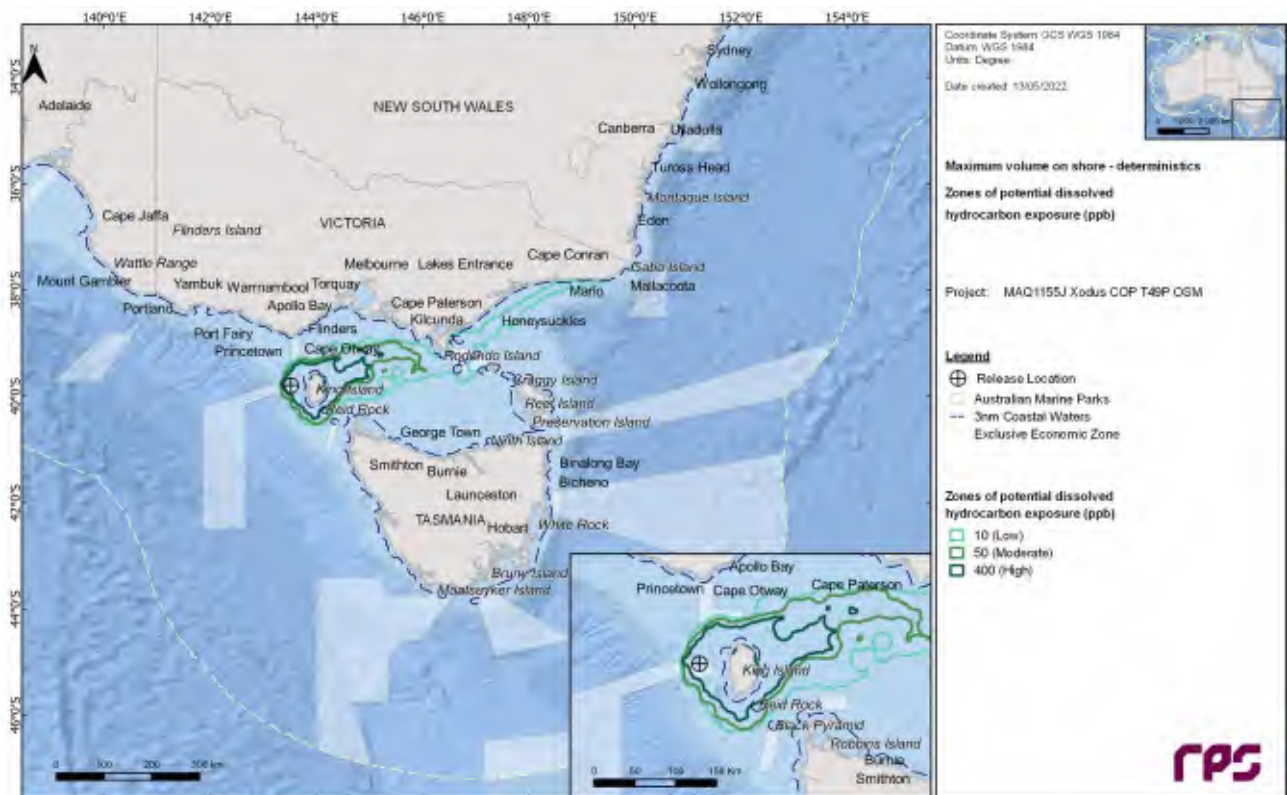


Figure 14.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

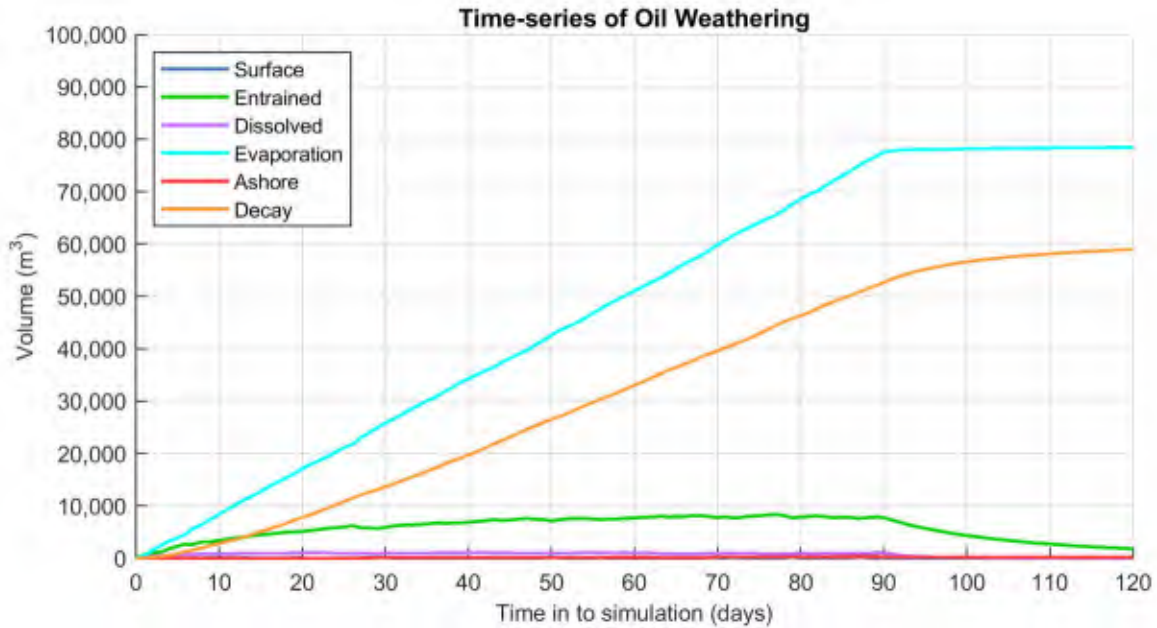


Figure 14.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

14.3.2 Minimum time to Shoreline Accumulation

The simulation that resulted in the minimum time to hydrocarbons ashore of 3.21 days was identified as run number 42 which commenced during winter conditions, 1 pm 8th September 2014.

Figure 14.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days).

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 14.15 and Figure 14.16, respectively.

Figure 14.17 presents the fates and weathering graph for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 77,200 m³ (~55%) was lost to the atmosphere through evaporation. Approximately, 60,150 m³ (~43%) of the released volume decayed, while approximately 2,180 m³ (~2%) was predicted to remain within the water column and approximately 24 m³ (<1%) remained on shorelines.

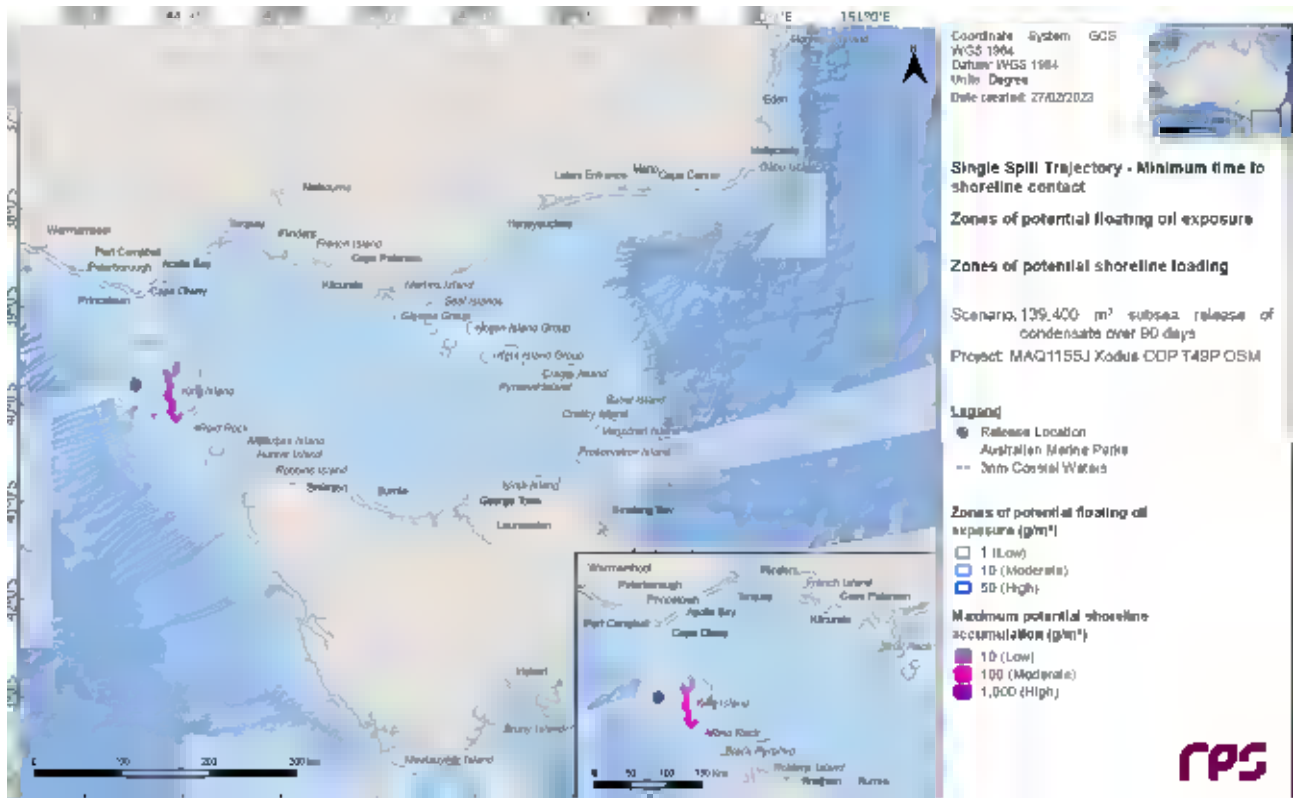


Figure 14.14 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 2.

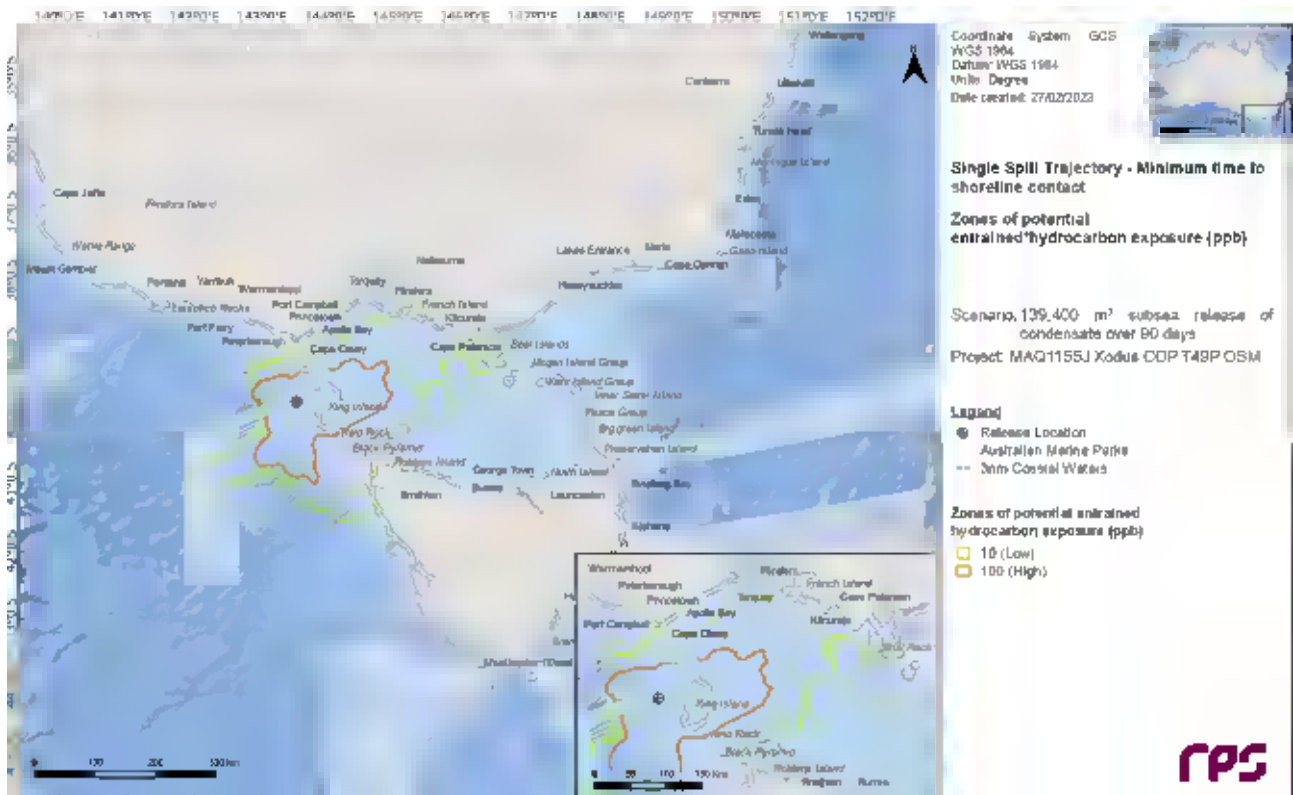


Figure 14.15 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 2.

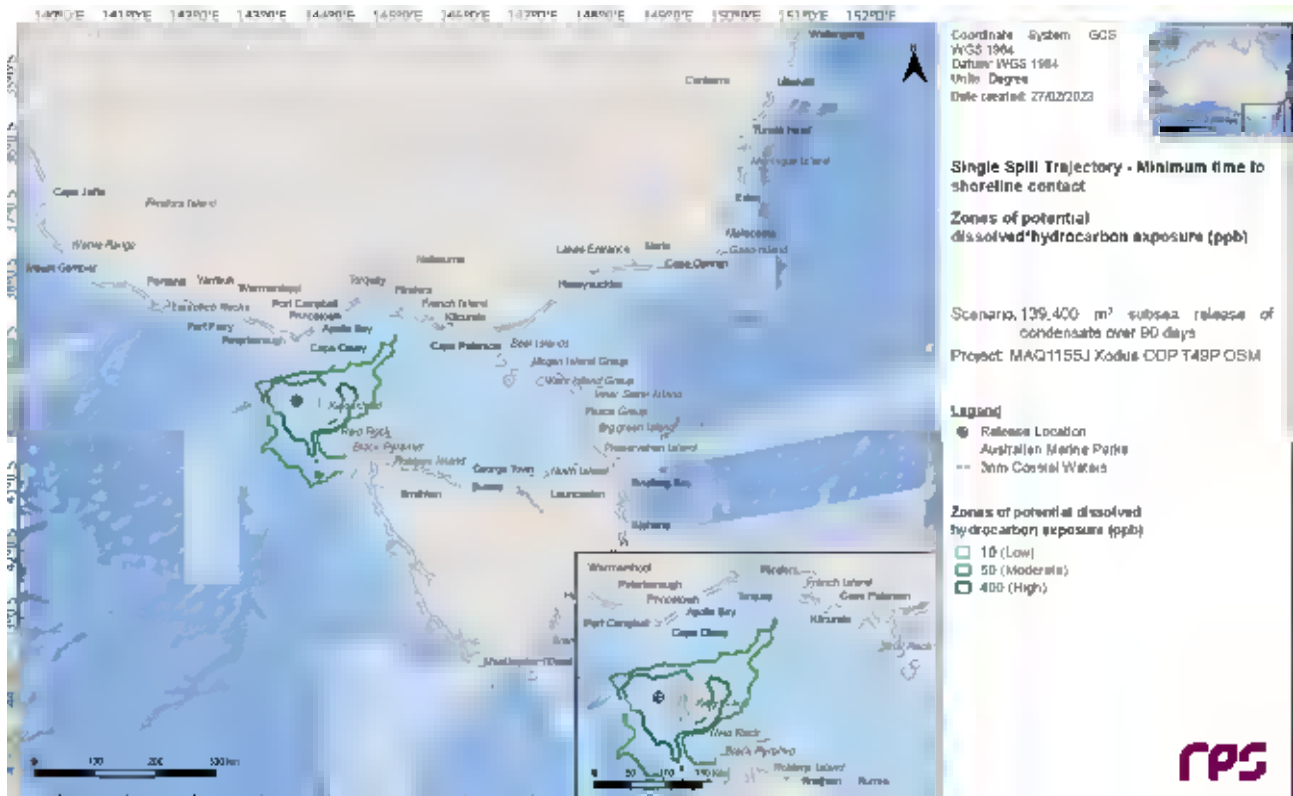


Figure 14.16 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 2.

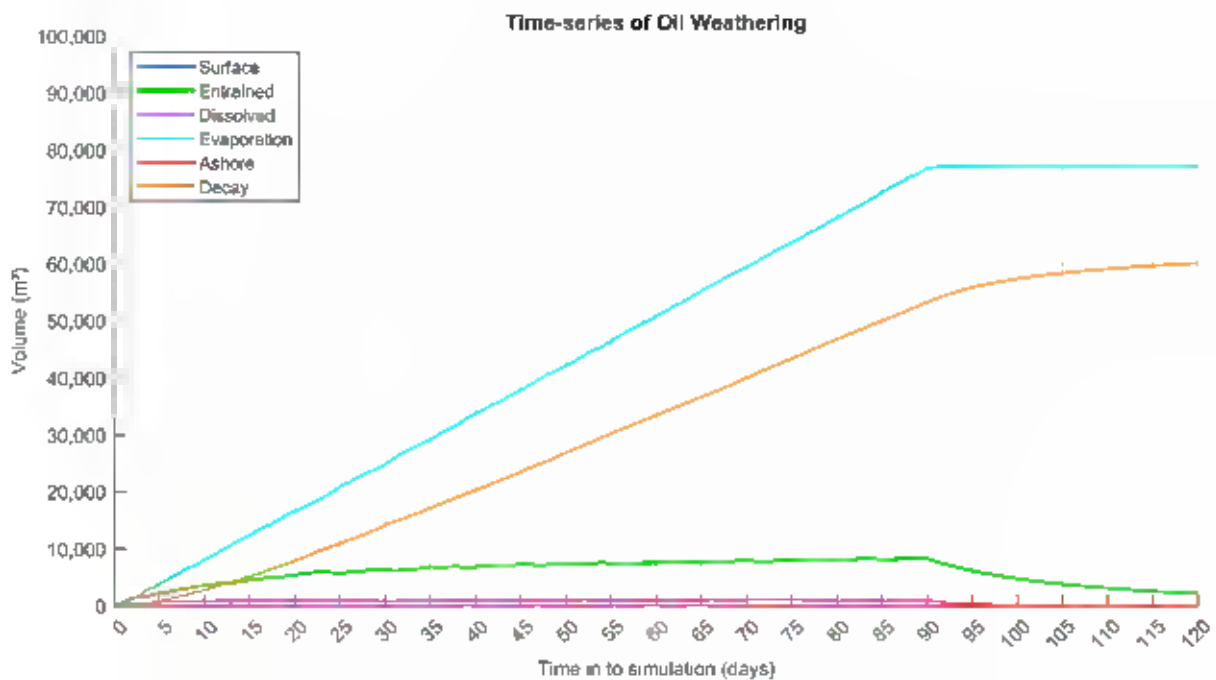


Figure 14.17 Predicted weathering and fates for the simulation that led to the minimum time to shoreline accumulation a subsea LOWC at Location 2.

15 LOCATION 3 LOWC RESULTS

This scenario examined the potential exposure following a LOWC at Location 3. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 15.1 presents the low threshold EMBA, Section 15.2 shows the seasonal (or stochastic) analysis results, while Section 15.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

15.1 EMBA

Figure 15.1 shows the EMBA for Location 3. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

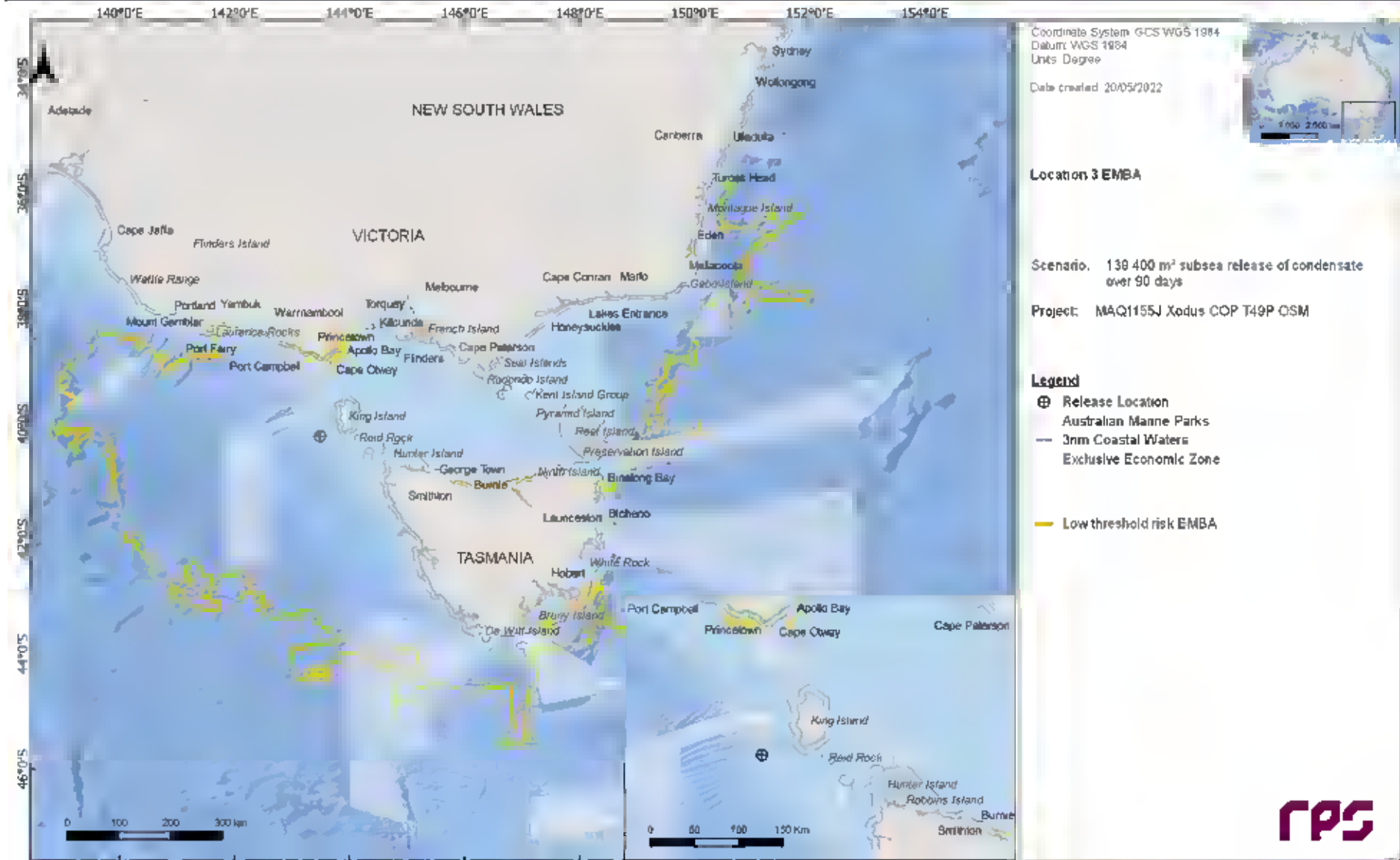


Figure 15.1 Predicted low threshold EMBA from a subsea LOWC at Location 3. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

15.2 Stochastic Analysis

15.2.1 Floating Oil Exposure

Table 15-1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 15-2 summarises the potential floating oil exposure to individual receptors for each season. The exposure by floating oil to BIAs can be found in Appendix A.

Figure 15.2 to Figure 15.3 illustrate the extent of floating oil exposure for each season.

The largest swept area of floating oil exposure at or above the low threshold during winter and summer conditions for a single simulation was 1,405 km² and 1,270 km², respectively.

Table 15-1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	143.1	15.4	0.3
	Maximum distance (km) from release location (99 th percentile)	99.8	15.1	0.3
	Direction	ENE	S	SE
Winter	Maximum distance (km) from release location	196.2	14.3	1.3
	Maximum distance (km) from release location (99 th percentile)	126.8	13.5	1.3
	Direction	E	SW	ENE

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Table 15-2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 3 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
AMP	Apollo	-	-	-	-	-	-	1	-	-	61.5	-	-
	Boags	-	-	-	-	-	-	2	-	-	42.08	-	-
	Franklin	8	-	-	8.42	-	-	45	-	-	2.25	-	-
	Zeehan	48	-	-	1.54	-	-	54	-	-	1.96	-	-
IBRA	King Island	76	-	-	2.13	-	-	97	-	-	2.25	-	-
IMCRA	Boags	-	-	-	-	-	-	5	-	-	14.75	-	-
	Central Bass Strait	36	-	-	4.17	-	-	81	-	-	2.54	-	-
	Franklin	2	-	-	8.42	-	-	7	-	-	39.92	-	-
	Otway	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
KEF	West Tasmania Canyons	99	-	-	1	-	-	81	-	-	0.83	-	-
RSB	Bell Reef	4	-	-	7.25	-	-	13	-	-	2.33	-	-
	Albatross Island	-	-	-	-	-	-	-	-	-	-	-	-
Near Shore Waters	Black Pyramid	-	-	-	-	-	-	1	-	-	73.29	-	-
	Circular Head	-	-	-	-	-	-	10	-	-	2.38	-	-
	Hunter Island	-	-	-	-	-	-	5	-	-	43.42	-	-
	King Island	68	-	-	2.13	-	-	9	-	-	15.21	-	-
	Reid Rock	23	-	-	3.21	-	-	96	-	-	2.25	-	-
State Waters	Tasmania	97	-	-	2.13	-	-	99	-	-	1.42	-	-

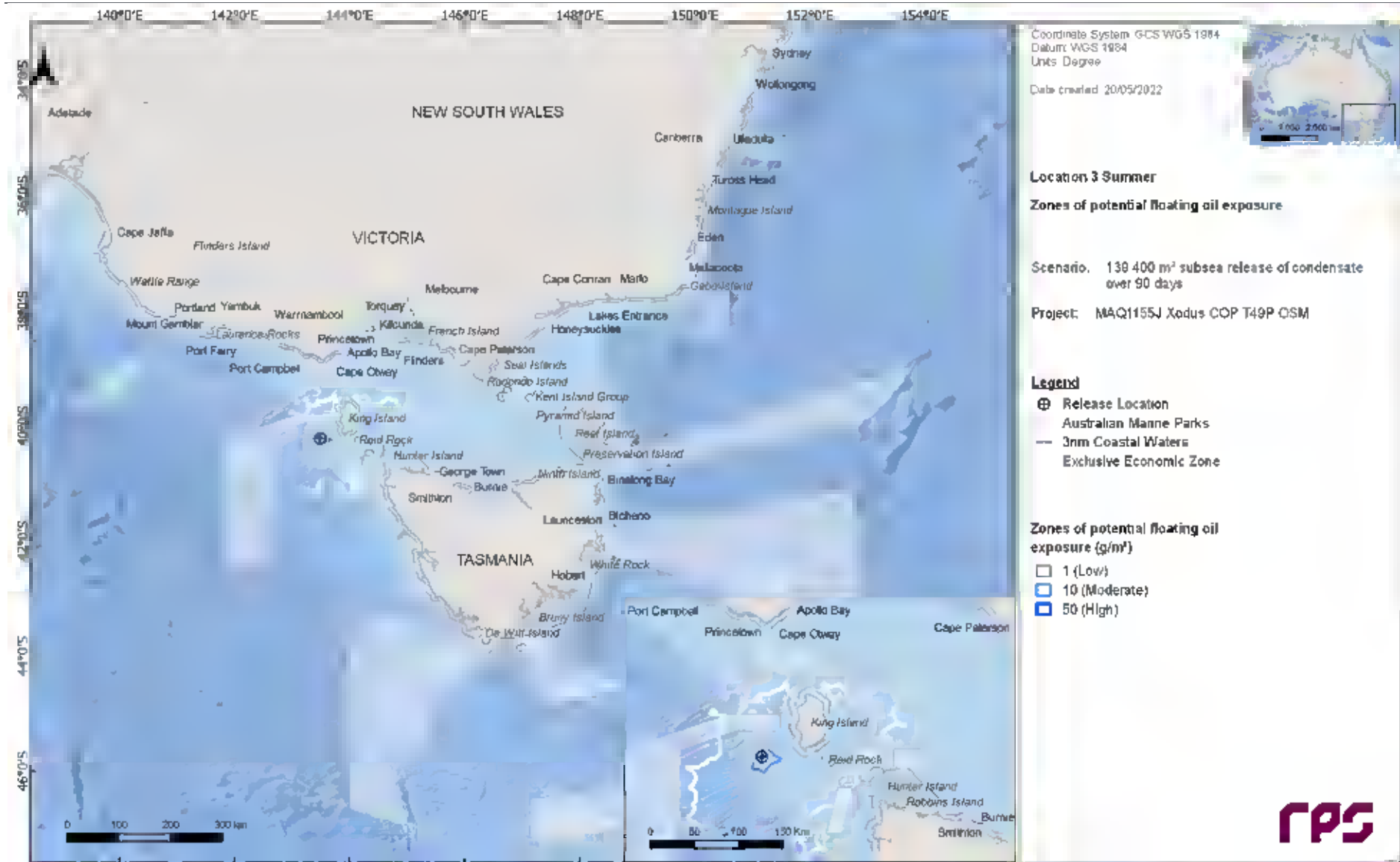


Figure 15.2 Zones of potential floating oil exposure from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

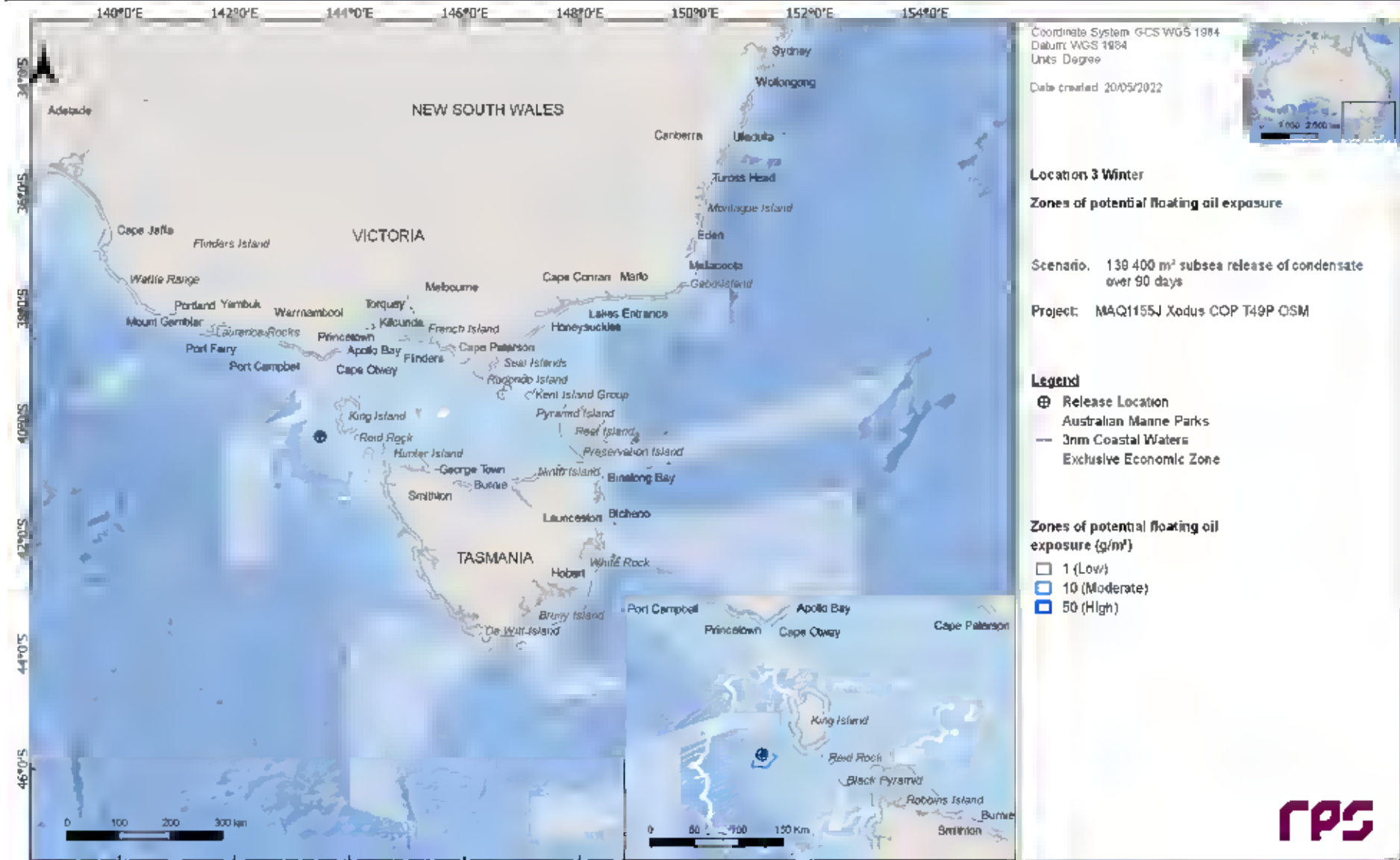


Figure 15.3 Zones of potential floating oil exposure from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.2.2 Shoreline Accumulation

Table 15-3 summarises the predicted accumulation on any shoreline during each season.

Table 15-4 to Table 15-5 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 15.4 and Figure 15.5.

Table 15-3 Summary of accumulation on any shoreline from a subsea LOWC at Location 3 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	100	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	4.58	4.00
Maximum volume of hydrocarbons ashore (m ³)	26.5	58.7
Average volume of hydrocarbons ashore (m ³)	2.7	11.1
Maximum length of the shoreline at 10 g/m² (km)	113	133
Average shoreline length (km) at 10 g/m² (km)	44.6	71.5
Maximum length of the shoreline at 100 g/m² (km)	16	23
Average shoreline length (km) at 100 g/m² (km)	4.1	7.2
Maximum length of the shoreline at 1,000 g/m² (km)	1	1
Average shoreline length (km) at 1,000 g/m² (km)	1	1

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Table 15-4 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 3 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Albatross Island	1	-	-	63	-	-	2	15	< 0.1	< 0.1	1	-	-	1	-	-
Anser Island	5	-	-	61.88	-	-	3	22	< 0.1	< 0.1	1	-	-	1	-	-
Badger Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Black Pyramid	26	-	-	12.17	-	-	8	48	< 0.1	< 0.1	1	-	-	1	-	-
Cape Barren Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chalky Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circular Head	64	6	-	12.17	47.17	-	3	286	0.2	2.2	10.2	1.1	-	26.8	1.9	-
Clarke Island	1	-	-	119.04	-	-	1	16	< 0.1	0.3	1.9	-	-	1.9	-	-
Craggy Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Curtis Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
De Witt Island	1	-	-	66.08	-	-	1	10	< 0.1	< 0.1	1	-	-	1	-	-
Dorset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Gippsland	2	-	-	88.63	-	-	1	18	< 0.1	< 0.1	1	-	-	1	-	-
East Kangaroo Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flinders Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glennie Group	7	-	-	47.46	-	-	2	31	< 0.1	< 0.1	1.5	-	-	2.9	-	-
Hogan Island Group	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hunter Island	51	2	-	13.38	58.71	-	4	110	< 0.1	1.4	3.4	1	-	11.5	1	-
Huon Valley	7	-	-	31.88	-	-	1	27	< 0.1	0.3	2.7	-	-	4.8	-	-
Inner Sister Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kanowna Island	1	-	-	89.25	-	-	2	10	< 0.1	< 0.1	1	-	-	1	-	-
Kent Island Group	5	-	-	63.67	-	-	1	19	< 0.1	< 0.1	1.3	-	-	1.9	-	-
King Island	98	56	2	4.58	8.17	75.54	13	1,643	2.1	25	27.3	4.2	1	80.3	15.3	1

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Moncoeur Islands	1	-	-	70.63	-	-	2	13	< 0.1	< 0.1	1	-	-	1	-	-
Mount Chappell Island	1	-	-	119.25	-	-	2	10	< 0.1	0.1	1	-	-	1	-	-
Norman Island	7	-	-	47.67	-	-	4	33	< 0.1	0.3	2	-	-	2.9	-	-
Outer Sister Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prime Seal Island	1	-	-	119.46	-	-	< 1	14	< 0.1	0.2	1	-	-	1	-	-
Pyramid Island	1	-	-	65	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
Reef Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reid Rock	67	1	-	4.96	89.5	-	15	147	< 0.1	0.7	2.3	1	-	2.9	1	-
Robbins Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rodondo Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seal Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shellback Island	1	-	-	50.25	-	-	3	11	< 0.1	< 0.1	1	-	-	1	-	-
Skull Rock	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Gippsland	7	-	-	47.5	-	-	2	53	< 0.1	0.8	3.7	-	-	4.8	-	-
Three Hummock Island	4	-	-	44.75	-	-	2	26	< 0.1	< 0.1	1.4	-	-	2.9	-	-
Wellington	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Coast	53	7	-	14.38	32.21	-	2	196	0.2	3	9.3	1	-	42.1	1	-
Cape Liptrap (NW)	2	-	-	77.96	-	-	2	22	< 0.1	< 0.1	1	-	-	1	-	-
Croajingolong (West)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ocean Grange	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Point Hicks	2	-	-	88.63	-	-	1	18	< 0.1	< 0.1	1	-	-	1	-	-
Wilsons Promontory (West)	7	-	-	47.5	-	-	2	53	< 0.1	0.8	3.4	-	-	4.8	-	-

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Table 15-5 Summary of oil accumulation on individual shoreline sectors from a subsea LOWC at Location 3 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Albatross Island	12	-	-	13.92	-	-	3	41	< 0.1	0.1	2.1	-	-	3.8	-	-
Anser Island	5	-	-	35.42	-	-	4	24	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Badger Island	5	-	-	47.63	-	-	2	18	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Black Pyramid	36	-	-	5.54	-	-	10	46	< 0.1	< 0.1	1	-	-	1	-	-
Cape Barren Osland	3	-	-	44.96	-	-	1	24	< 0.1	< 0.1	3.8	-	-	5.7	-	-
Chalky Island	1	-	-	44.33	-	-	2	10	< 0.1	< 0.1	1	-	-	1	-	-
Circular Head	75	8	-	9.88	26.5	-	4	253	0.4	5.7	13.9	1.6	-	38.2	1.9	-
Clarke Island	9	-	-	44.13	-	-	2	18	< 0.1	0.3	1.3	-	-	2.9	-	-
Craggy Island	4	-	-	46.92	-	-	2	18	< 0.1	< 0.1	1.4	-	-	1.9	-	-
Curtis Island	8	-	-	23.46	-	-	2	14	< 0.1	< 0.1	1.1	-	-	1.9	-	-
De Witt Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dorset	2	-	-	76.92	-	-	< 1	25	< 0.1	0.2	1.4	-	-	1.9	-	-
East Gippsland	8	-	-	27.17	-	-	1	38	< 0.1	< 0.1	1.4	-	-	1.9	-	-
East Kangaroo Island	1	-	-	81.67	-	-	2	12	< 0.1	< 0.1	1	-	-	1	-	-
Flinders Island	11	-	-	33.29	-	-	1	24	< 0.1	< 0.1	3.3	-	-	12.4	-	-
Glennie Group	12	-	-	25.25	-	-	3	30	< 0.1	0.2	2.1	-	-	4.8	-	-
Hogan Island Group	1	-	-	65.92	-	-	2	10	< 0.1	< 0.1	1	-	-	1	-	-
Hunter Island	62	5	-	6.63	15.88	-	6	132	0.1	2.6	6.8	1.3	-	22.9	1.9	-
Huon Valley	15	-	-	21.67	-	-	2	52	< 0.1	0.9	3.8	-	-	7.6	-	-
Inner Sister Island	1	-	-	47.92	-	-	1	11	< 0.1	< 0.1	1	-	-	1	-	-
Kanowna Island	10	-	-	29.33	-	-	3	26	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Kent Island Group	32	-	-	19.88	-	-	3	44	< 0.1	0.2	2.4	-	-	5.7	-	-
King Island	100	83	11	4	6.13	35.54	24	1,600	10.1	58.4	36.9	7	1	89.9	21	1

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Moncoeur Islands	1	-	-	68.08	-	-	2	18	< 0.1	< 0.1	1	-	-	1	-	-
Mount Chappell Island	6	-	-	44.13	-	-	3	22	< 0.1	< 0.1	1.1	-	-	1.9	-	-
Norman Island	10	6	-	25.5	42.46	-	11	136	< 0.1	2.2	2.7	1	-	3.8	1	-
Outer Sister Island	2	-	-	44.5	-	-	2	19	< 0.1	< 0.1	1	-	-	1	-	-
Prime Seal Island	12	-	-	36.25	-	-	2	28	< 0.1	< 0.1	1.3	-	-	3.8	-	-
Pyramid Island	17	-	-	18.17	-	-	5	55	< 0.1	0.2	1.4	-	-	1.9	-	-
Reef Island	2	-	-	45.38	-	-	2	14	< 0.1	< 0.1	1	-	-	1	-	-
Reid Rock	78	3	-	5.46	29.5	-	17	122	< 0.1	0.2	2.1	1	-	2.9	1	-
Robbins Island	3	-	-	25.67	-	-	2	12	< 0.1	< 0.1	1	-	-	1	-	-
Rodondo Island	6	-	-	22.67	-	-	4	20	< 0.1	< 0.1	1	-	-	1	-	-
Seal Islands	3	-	-	51.04	-	-	2	11	< 0.1	< 0.1	1	-	-	1	-	-
Shellback Island	7	-	-	25.58	-	-	9	40	< 0.1	0.2	1	-	-	1	-	-
Skull Rock	10	-	-	29.33	-	-	4	26	< 0.1	< 0.1	1.1	-	-	1.9	-	-
South Gippsland	10	-	-	25.71	-	-	3	81	< 0.1	2.2	8.6	-	-	14.3	-	-
Three Hummock Island	19	-	-	15.67	-	-	2	32	< 0.1	< 0.1	1.5	-	-	2.9	-	-
Wellington	1	-	-	34	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
West Coast	68	10	-	14.04	27.08	-	3	140	0.3	2.7	14.9	1.3	-	35.4	2.9	-
Cape Liptrap (NW)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croajingolong (West)	2	-	-	36.92	-	-	2	17	< 0.1	< 0.1	1	-	-	1	-	-
Ocean Grange	1	-	-	34	-	-	1	14	< 0.1	< 0.1	1	-	-	1	-	-
Point Hicks	8	-	-	27.17	-	-	2	38	< 0.1	< 0.1	1.2	-	-	1.9	-	-
Wilsons Promontory (West)	10	-	-	25.71	-	-	3	81	< 0.1	2.2	8.6	-	-	14.3	-	-

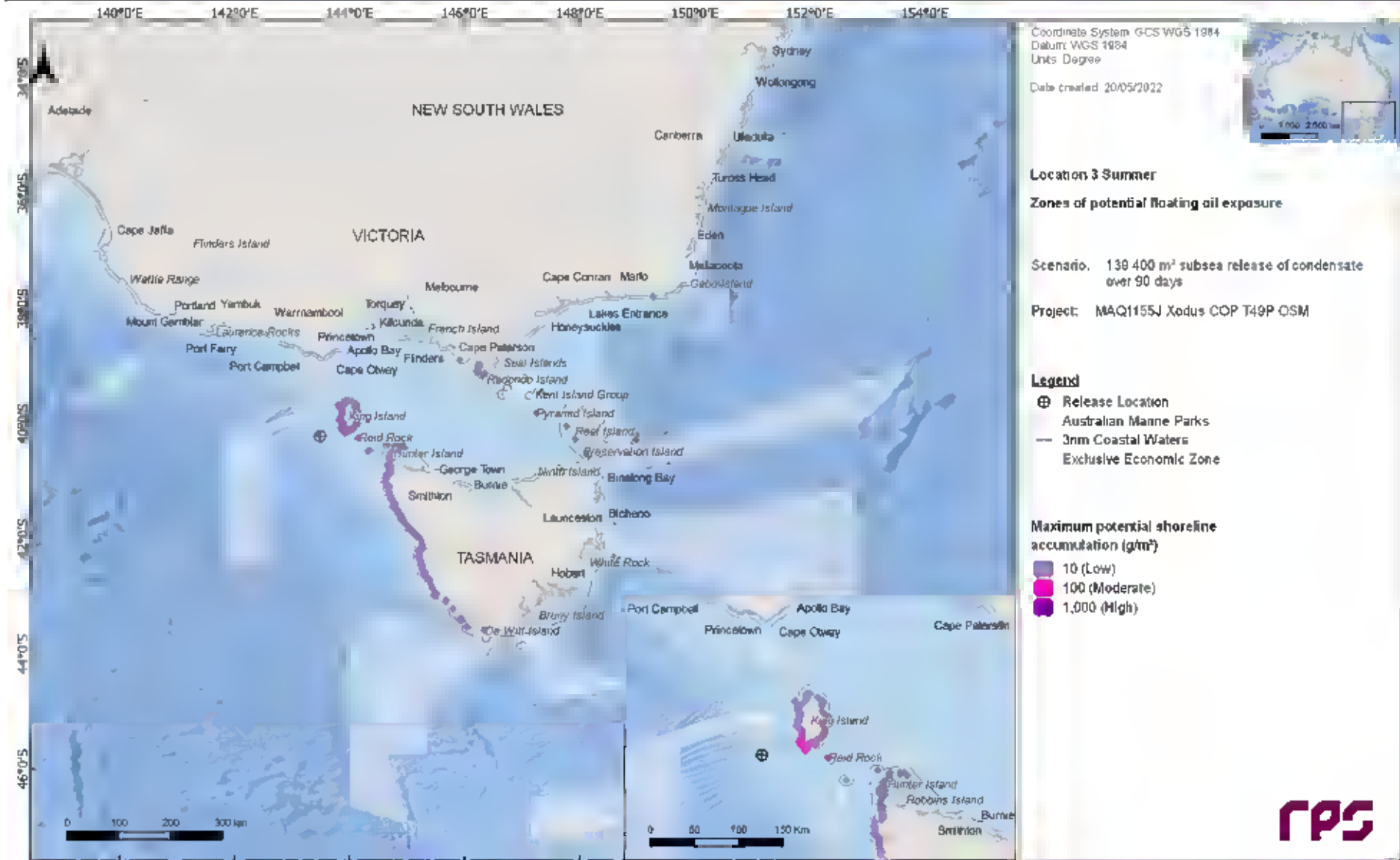


Figure 15.4 Maximum potential shoreline loading from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

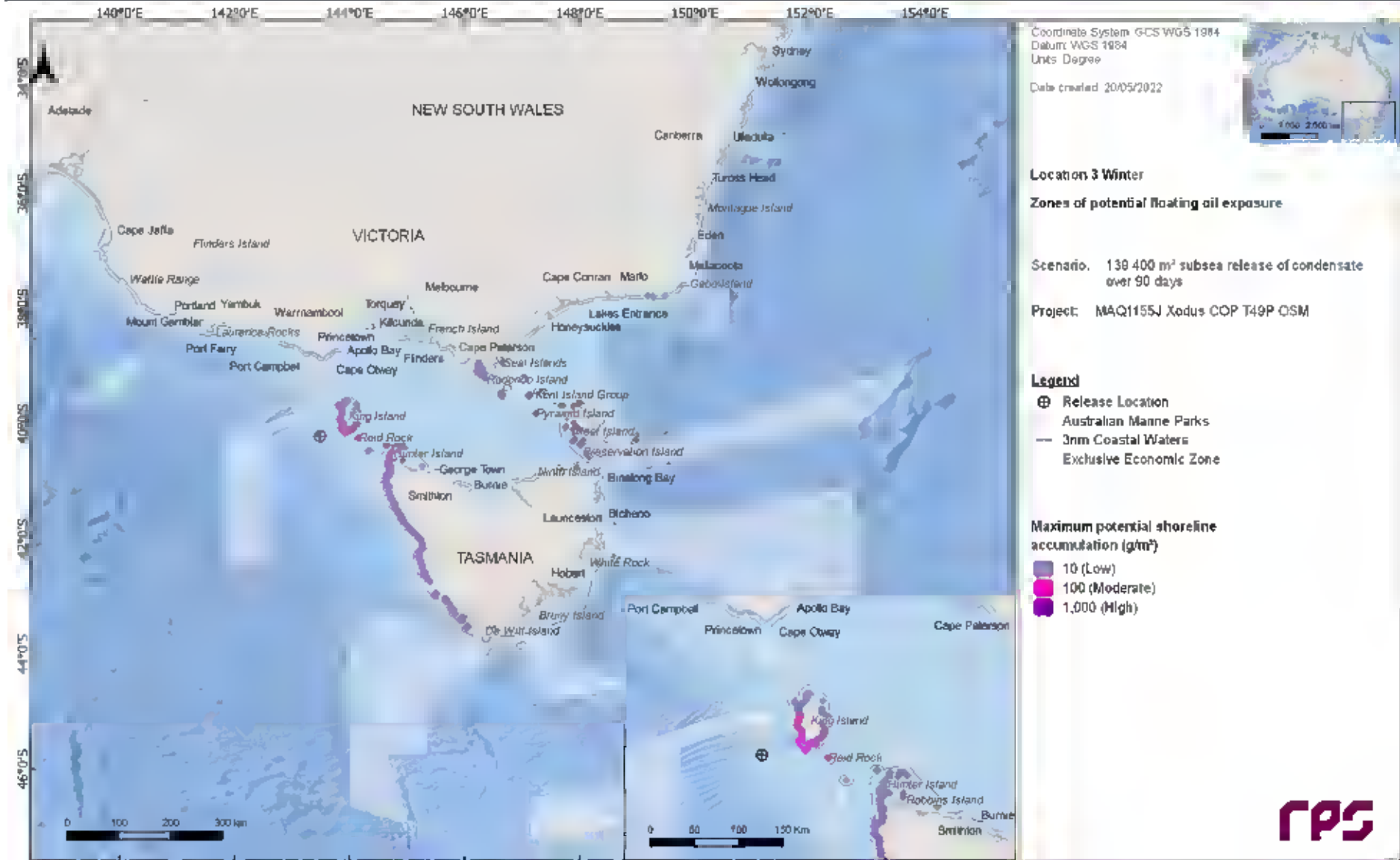


Figure 15.5 Maximum potential shoreline loading from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.2.3 In-water exposure

15.2.3.1 Dissolved Hydrocarbons

Table 15-6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 15-7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m depth layer for each threshold and season.

Figure 15.6 and Figure 15.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers. Figures showing the extent of dissolved hydrocarbon exposure in the 10-20 m, 20 – 30 m and 30 – 50 m depth layers for each season are presented in Appendix A.

Table 15-6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10m) from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	642	492	308
	Maximum distance (km) from release location (99 th percentile)	455	371	166
	Direction	ENE	SE	ENE
Winter	Maximum distance (km) from release location	773	456	257
	Maximum distance (km) from release location (99 th percentile)	502	334	169
	Direction	ENE	SSE	SSE

Table 15-7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Mod erate	High		Low	Mode rate	High	
AMP	Apollo	512	16	9	1	394	30	10	-
	Beagle	533	9	5	1	322	35	7	-
	Boags	661	61	27	1	1,283	87	57	5
	Franklin	1,515	99	83	9	1,827	100	96	18
	Huon	30	1	-	-	14	1	-	-
	Nelson	12	1	-	-	18	1	-	-
	Tasman Fracture	73	4	1	-	54	3	1	-
	Zeehan	3,255	69	56	20	3,213	72	59	26
CA	Montagu Beach	-	-	-	-	32	2	-	-
	Unnamed (Duck Bay)	-	-	-	-	28	2	-	-
IBRA	Bateman	-	-	-	-	19	1	-	-
	East Gippsland Lowlands	12	1	-	-	23	1	-	-
	Flinders	188	7	4	-	225	26	8	-
	Gippsland Plain	54	3	1	-	22	3	-	-
	King Island	2,466	100	97	34	2,364	100	100	50
	South East Coastal Ranges	-	-	-	-	19	1	-	-
	Strzelecki Ranges	35	3	-	-	15	2	-	-
	Tasmanian South East	12	1	-	-	7	-	-	-
	Tasmanian Southern Ranges	25	1	-	-	16	2	-	-
	Tasmanian West	225	37	10	-	173	31	4	-
IMCRA	Wilsons Promontory	25	3	-	-	49	14	-	-
	Batemans Shelf	-	-	-	-	41	2	-	-
	Boags	572	68	25	1	1,150	87	49	3
	Bruny	23	1	-	-	-	-	-	-
	Central Bass Strait	2,322	97	83	9	2,497	100	100	16
	Central Victoria	168	5	3	-	156	13	2	-
	Davey	127	10	2	-	84	10	2	-
	Flinders	533	10	5	1	331	37	8	-
	Franklin	1,597	99	83	9	1,140	88	71	6
	Freycinet	14	1	-	-	-	-	-	-
Otway	5,914	100	100	100	8,039	100	100	100	
Twofold Shelf	389	8	4	-	225	17	3	-	

REPORT

	Victorian Embayments	29	1	-	-	22	1	-	-
KEF	Seamounts South and east of Tasmania	-	-	-	-	22	1	-	-
	Shelf rocky reefs	-	-	-	-	11	1	-	-
	Upwelling East of Eden	89	3	1	-	42	5	-	-
	West Tasmania Canyons	6,534	100	100	96	3,041	95	92	70
MNP	Bunurong	22	2	-	-	10	1	-	-
	Cape Howe	-	-	-	-	23	1	-	-
	Ninety Mile Beach	-	-	-	-	12	1	-	-
	Wilson's Promontory	24	2	-	-	55	10	1	-
MP	Batemans	-	-	-	-	23	1	-	-
NP	Kent Group	233	6	2	-	93	13	1	-
NPS4	Nooramunga Marine and Coastal Park	46	1	-	-	22	1	-	-
	Wilson's Promontory Marine Park	21	2	-	-	15	1	-	-
	Wilson's Promontory Marine Reserve	12	2	-	-	15	2	-	-
Ramsar	Corner Inlet	46	1	-	-	22	1	-	-
	Lavinia	210	48	13	-	366	74	20	-
	Western Port	-	-	-	-	12	1	-	-
RSB	Bell Reef	1,258	100	98	23	1,985	100	100	46
	Brown Rocks	166	29	6	-	163	36	7	-
	Cody Bank	50	4	1	-	36	6	-	-
	Cutter Rock	28	7	-	-	87	12	2	-
	Endeavour Reef	13	1	-	-	14	1	-	-
	Wakitipu Rock	26	1	-	-	14	2	-	-
	Warrego Rock	-	-	-	-	19	1	-	-
Near Shore Waters	Wright Rock	26	1	-	-	13	1	-	-
	Albatross Island	272	52	15	-	863	69	31	2
	Anser Island	12	1	-	-	25	5	-	-
	Bass Coast	-	-	-	-	10	1	-	-
	Bega Valley	12	1	-	-	19	1	-	-
	Black Pyramid	820	95	71	4	1,461	100	92	14
	Bruny Island	12	1	-	-	-	-	-	-
	Circular Head	382	44	13	-	406	43	12	1
	Craggy Island	-	-	-	-	33	2	-	-
	Curtis Island	129	6	4	-	214	26	8	-
	De Witt Island	12	2	-	-	16	4	-	-
	East Gippsland	11	1	-	-	15	1	-	-
Eurobodalla	-	-	-	-	19	1	-	-	

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Flinders Island	-	-	-	-	14	1	-	-	
Gabo Island	-	-	-	-	16	1	-	-	
Glennie Group	21	3	-	-	33	7	-	-	
Hogan Island Group	151	7	2	-	225	12	3	-	
Hunter Island	310	29	9	-	461	48	14	1	
Huon Valley	42	7	-	-	24	4	-	-	
Kanowna Island	10	1	-	-	22	9	-	-	
Kent Island Group	188	6	2	-	93	17	1	-	
King Island	2,466	100	97	34	2,364	100	100	49	
Maatsuyker Island	20	4	-	-	25	2	-	-	
Moncoeur Islands	25	3	-	-	33	9	-	-	
Montague Island	-	-	-	-	19	1	-	-	
Mornington Peninsula	13	1	-	-	0	0	-	-	
Norman Island	14	3	-	-	12	1	-	-	
Phillip Island	11	1	-	-	-	-	-	-	
Pyramid Island	28	1	-	-	22	7	-	-	
Reid Rock	2,263	100	95	26	2,128	100	100	50	
Robbins Island	-	-	-	-	133	3	1	-	
Rodondo Island	16	3	-	-	49	14	-	-	
Round Top Island	12	1	-	-	14	1	-	-	
Seal Islands	-	-	-	-	29	3	-	-	
Shellback Island	21	2	-	-	13	1	-	-	
Skull Rock	12	1	-	-	41	8	-	-	
South Gippsland	54	3	1	-	26	3	-	-	
Three Hummock Island	286	16	5	-	182	31	8	-	
Waratah-Wynyard	-	-	-	-	21	1	-	-	
Wellington	46	1	-	-	22	1	-	-	
West Coast	222	32	5	-	114	31	3	-	
State Waters	New South Wales	12	1	-	23	2	-	-	
	Tasmania	2,466	100	99	56	3,117	100	100	77
	Victoria	74	5	1	-	99	18	2	-

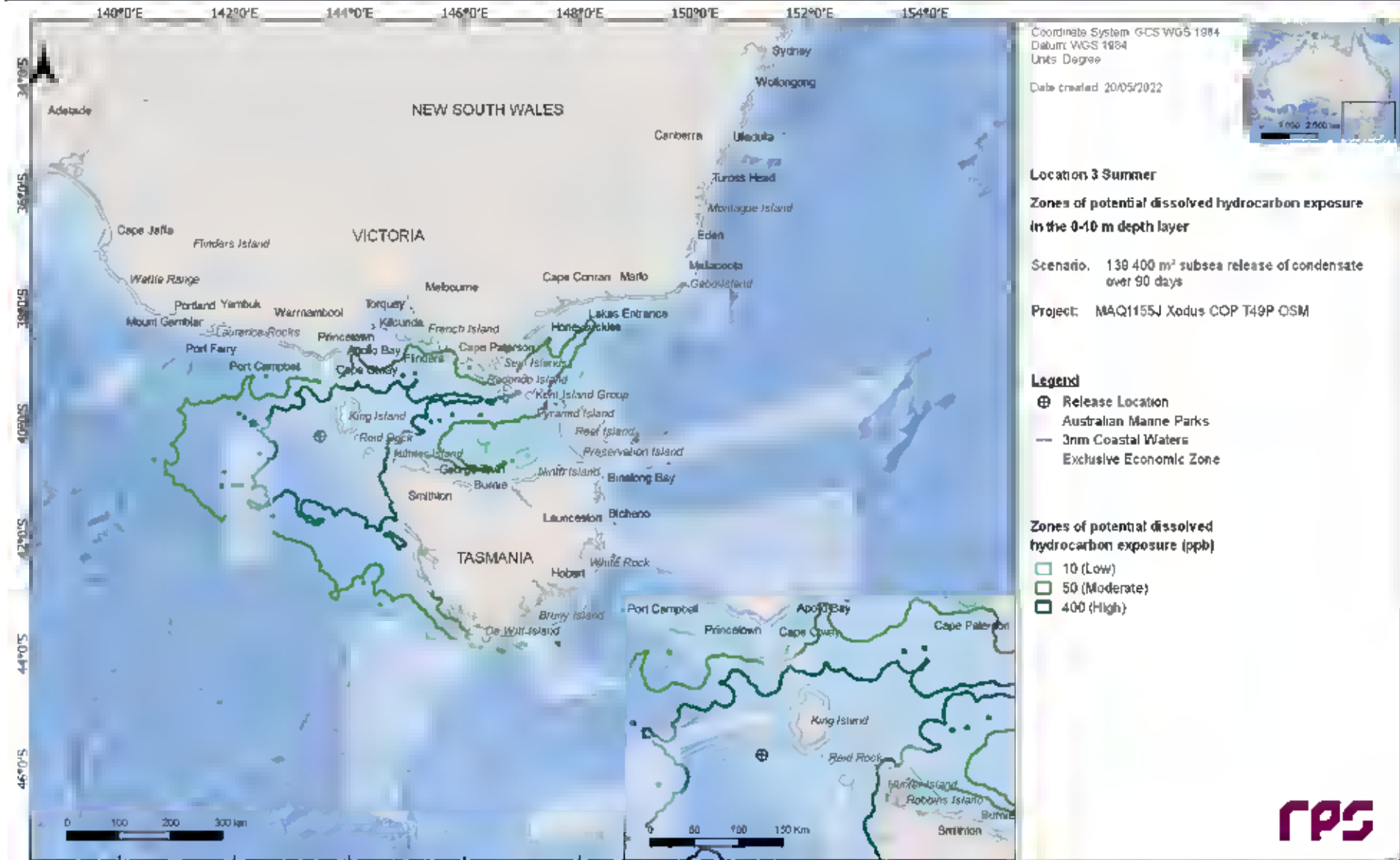


Figure 15.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

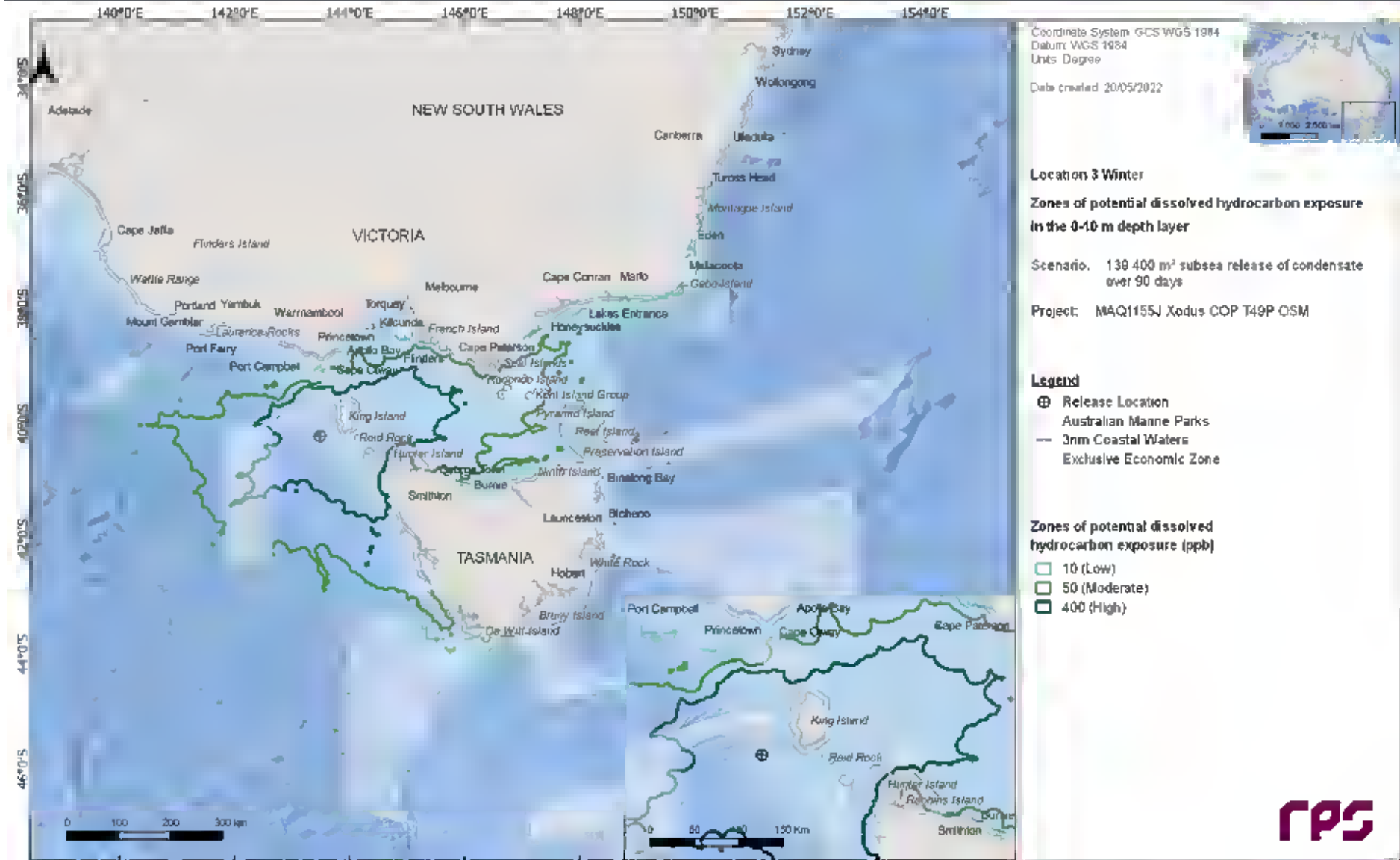


Figure 15.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.2.3.2 Entrained Hydrocarbons

Table 15-8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 15-9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layer, for each season.

Figure 15.8 and Figure 15.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer. Extent of the entrained hydrocarbon exposure for each season in the 10 -20 m and 20 – 30 m depth layers is presented in Appendix A.

Table 15-8 Maximum distance and direction by entrained hydrocarbon exposure (0-10m) from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	845	340
	Maximum distance (km) from release location (99 th percentile)	725	294
	Direction	ENE	SE
Winter	Maximum distance (km) from release location	846	430
	Maximum distance (km) from release location (99 th percentile)	756	265
	Direction	ENE	SE

Table 15-9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter				
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure			
		Low	High		Low	High		
AMP	Apollo	123	56	3	347	62	11	
	Beagle	85	37	-	106	90	3	
	Boags	450	99	48	527	100	83	
	East Gippsland	10	-	-	14	3	-	
	Flinders	7	-	-	18	7	-	
	Franklin	989	100	94	1,090	100	100	
	Huon	27	12	-	19	16	-	
	Nelson	22	3	-	23	9	-	
	Tasman Fracture	47	20	-	86	21	-	
	Zeehan	1,084	91	68	1,721	98	64	
CA	Arthur Bay	15	1	-	16	11	-	
	Bateman	9	-	-	18	5	-	
	East Gippsland Lowlands	23	9	-	27	27	-	
	Flinders	83	29	-	125	85	5	
	Gippsland Plain	82	21	-	132	28	6	
	King Island	1,313	100	99	1,650	100	100	
	Otway Plain	17	1	-	12	1	-	
	South East Coastal Ranges	8	-	-	11	2	-	
	Strzelecki Ranges	70	21	-	68	26	-	
	Tasmanian Northern Slopes	7	-	-	14	3	-	
IBRA	Tasmanian South East	15	4	-	15	7	-	
	Tasmanian Southern Ranges	34	12	-	38	18	-	
	Tasmanian West	179	93	16	154	74	13	
	Warrnambool Plain	12	2	-	14	2	-	
	Wilson's Promontory	129	40	5	171	62	7	
	IMCRA	Batemans Shelf	17	2	-	26	16	-
		Boags	470	99	52	530	100	86
		Bruny	25	9	-	17	9	-
		Central Bass Strait	968	100	96	656	100	100
		Central Victoria	98	33	-	112	56	1
Davey		90	46	-	120	29	7	
Flinders		129	45	5	175	90	7	
Franklin		427	100	76	458	100	69	
Freycinet		10	1	-	23	7	-	
Otway		13,383	100	100	11,498	100	100	
KEF	Twofold Shelf	83	29	-	102	77	1	
	Victorian Embayments	18	4	-	23	6	-	
	Big Horseshoe Canyon	19	2	-	21	17	-	

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	Bonney Coast Upwelling	12	3	-	17	2	-
	Canyons on the eastern continental slope	11	1	-	12	2	-
	Seamounts South and east of Tasmania	9	-	-	61	9	-
	Shelf rocky reefs	10	-	-	17	5	-
	Upwelling East of Eden	42	16	-	54	43	-
	West Tasmania Canyons	2,124	100	100	1,949	99	95
MNP	Bunurong	29	16	-	36	14	-
	Cape Howe	10	1	-	21	22	-
	Ninety Mile Beach	10	-	-	21	7	-
	Point Addis	13	1	-	7	-	-
	Point Hicks	24	13	-	24	29	-
	Port Phillip Heads	15	1	-	7	-	-
	Twelve Apostles	7	-	-	10	1	-
	Wilson's Promontory	129	34	5	175	54	7
MP	Batemans	12	1	-	19	7	-
MS	Beware Reef	9	-	-	17	9	-
	Mushroom Reef	13	4	-	15	3	-
NP	Kent Group	83	30	-	91	77	-
NPS4	Bunurong Marine Park	22	9	-	24	10	-
	Corner Inlet Marine and Coastal Park	13	6	-	25	6	-
	Nooramunga Marine and Coastal Park	8	-	-	15	7	-
	Shallow Inlet Marine and Coastal Park	11	1	-	19	6	-
	Wilson's Promontory Marine Park	88	20	-	140	28	6
	Wilson's Promontory Marine Reserve	118	31	5	162	49	6
NR	Chappell Islands	27	2	-	30	26	-
	Corner Inlet	13	6	-	25	7	-
	Gippsland Lakes	13	5	-	13	7	-
	Lavinia	160	91	8	148	95	12
Ramsar	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	15	1	-	5	-	-
	Western Port	13	1	-	12	1	-
RSB	Bell Reef	730	100	98	713	100	100
	Beware Reef	9	-	-	17	9	-
	Brown Rocks	123	90	8	206	88	20
	Cody Bank	39	27	-	41	30	-
	Cutter Rock	45	32	-	53	66	-
	Endeavour Reef	32	14	-	32	57	-
	New Zealand Star Bank	16	8	-	29	34	-
	Wakitipu Rock	27	15	-	34	62	-
	Warrego Rock	20	7	-	35	49	-
	Wright Rock	38	13	-	30	63	-
	Albatross Island	232	97	40	324	99	60

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	Anser Island	114	32	5	131	49	6
	Babel Island	11	1	-	14	4	-
	Badger Island	27	2	-	33	26	-
	Bass Coast	27	11	-	33	11	-
	Bega Valley	-	-	-	17	17	-
	Big green Island	21	2	-	26	19	-
	Black Pyramid	343	100	88	653	100	98
	Boxen Island	19	2	-	25	21	-
	Bruny Island	15	4	-	10	1	-
	Cape Barren Osland	19	2	-	26	19	-
	Chalky Island	22	2	-	22	21	-
	Circular Head	271	94	18	315	93	30
	Clarke Island	13	1	-	20	13	-
	Colac Otway	-	-	-	12	1	-
	Corangamite	10	-	-	11	1	-
	Craggy Island	23	6	-	32	46	-
	Curtis Island	76	28	-	84	85	-
	De Witt Island	48	23	-	46	23	-
	Dorset	10	1	-	14	7	-
	East Gippsland	23	9	-	27	27	-
	East Kangaroo Island	24	2	-	27	19	-
	Eurobodalla	-	-	-	17	4	-
Near Shore Waters	Flinders Island	21	2	-	26	27	-
	French Island	10	1	-	11	1	-
	Gabo Island	-	-	-	18	20	-
	Glennie Group	129	33	5	171	50	7
	Goose Island	22	2	-	27	23	-
	Greater Geelong	17	1	-	-	-	-
	Hogan Island Group	40	20	-	102	61	1
	Hunter Island	202	91	23	357	94	35
	Huon Valley	90	45	-	86	29	-
	Inner Sister Island	18	2	-	36	30	-
	Kanowna Island	112	33	4	131	51	6
	Kent Island Group	83	29	-	125	77	5
	King Island	1,313	100	99	1,650	100	100
	Lady Julia Percy Island	-	-	-	11	1	-
	Laurence Rocks	-	-	-	10	1	-
	Maatsuyker Island	55	27	-	42	23	-
	Mewstone	29	17	-	17	15	-
	Moncoeur Islands	35	39	-	76	60	-
	Montague Island	-	-	-	18	5	-
	Mornington Peninsula	17	4	-	16	3	-
Mount Chappell Island	27	2	-	33	25	-	
Moyne	12	2	-	14	2	-	
Ninth Island	12	1	-	15	7	-	
Norman Island	118	26	5	170	32	7	
	Outer Sister Island	20	2	-	37	30	-

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	Pasco Group	17	1	-	19	29	-
	Phillip Island	35	6	-	35	7	-
	Preservation Island	13	1	-	18	13	-
	Prime Seal Island	21	3	-	22	29	-
	Pyramid Island	47	25	-	63	70	-
	Reef Island	21	2	-	25	20	-
	Reid Rock	993	100	98	1,013	100	100
	Robbins Island	40	23	-	41	43	-
	Rodondo Island	59	39	-	95	62	-
	Round Top Island	33	21	-	32	22	-
	Seal Islands	29	7	-	35	34	-
	Shellback Island	81	21	-	128	29	6
	Skull Rock	100	33	-	121	52	6
	South Gippsland	119	30	5	155	47	6
	Surf Coast	14	1	-	-	-	-
	Tasman	-	-	-	13	2	-
	Three Hummock Island	161	88	5	172	89	12
	Waratah-Wynyard	7	-	-	14	3	-
	Warrnambool	-	-	-	11	1	-
	Wellington	12	3	-	23	8	-
	West Coast	179	93	16	154	71	13
	West Tamar	11	1	-	-	-	-
State Waters	New South Wales	12	1	-	23	17	-
	Tasmania	1,430	100	100	1,650	100	100
	Victoria	129	41	5	175	63	7

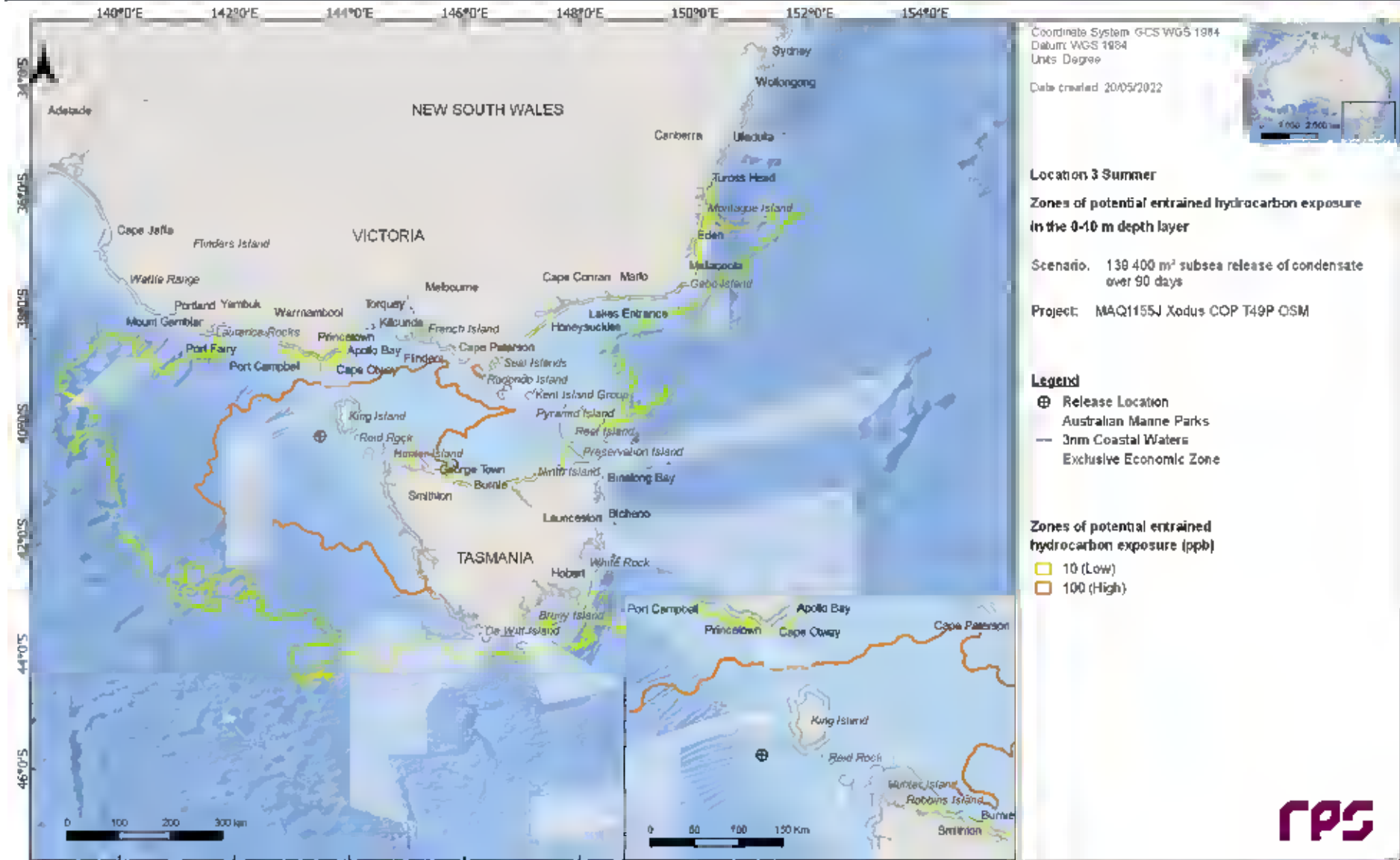


Figure 15.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

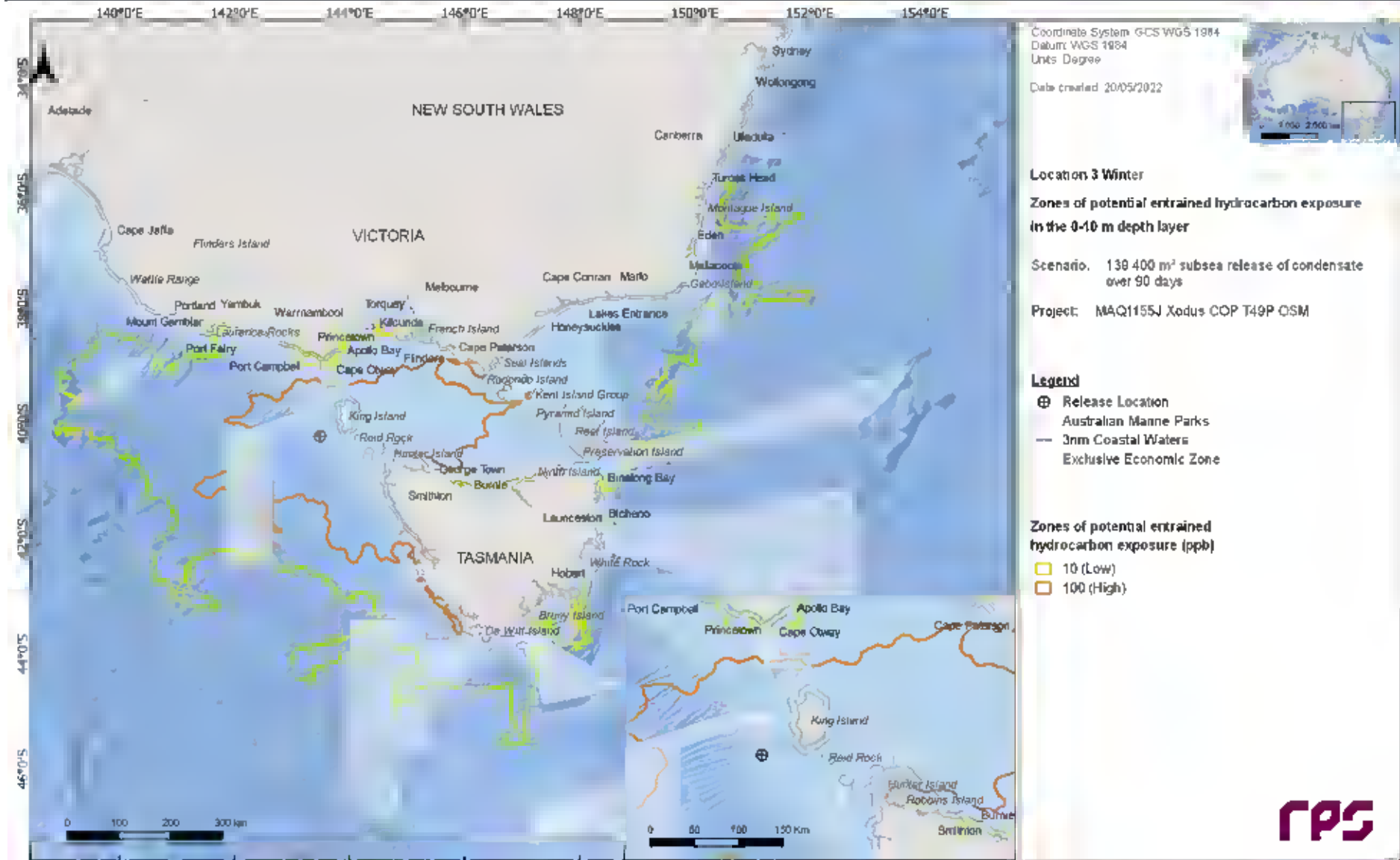


Figure 15.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.3 Deterministic Analysis

15.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore of 58.7 m³ was identified as run number 98 which commenced during winter conditions, 1 pm 12th June 2019.

Figure 15.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 9 of the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 15.11 and Figure 15.12, respectively.

Figure 15.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 87,500 m³ (~63%) was lost to the atmosphere through evaporation. Approximately, 50,000 m³ (~36%) of the released volume decayed, while approximately 1,800 m³ (~1%) was predicted to remain within the water column and approximately 55 m³ (<0.1%) remained on shorelines.

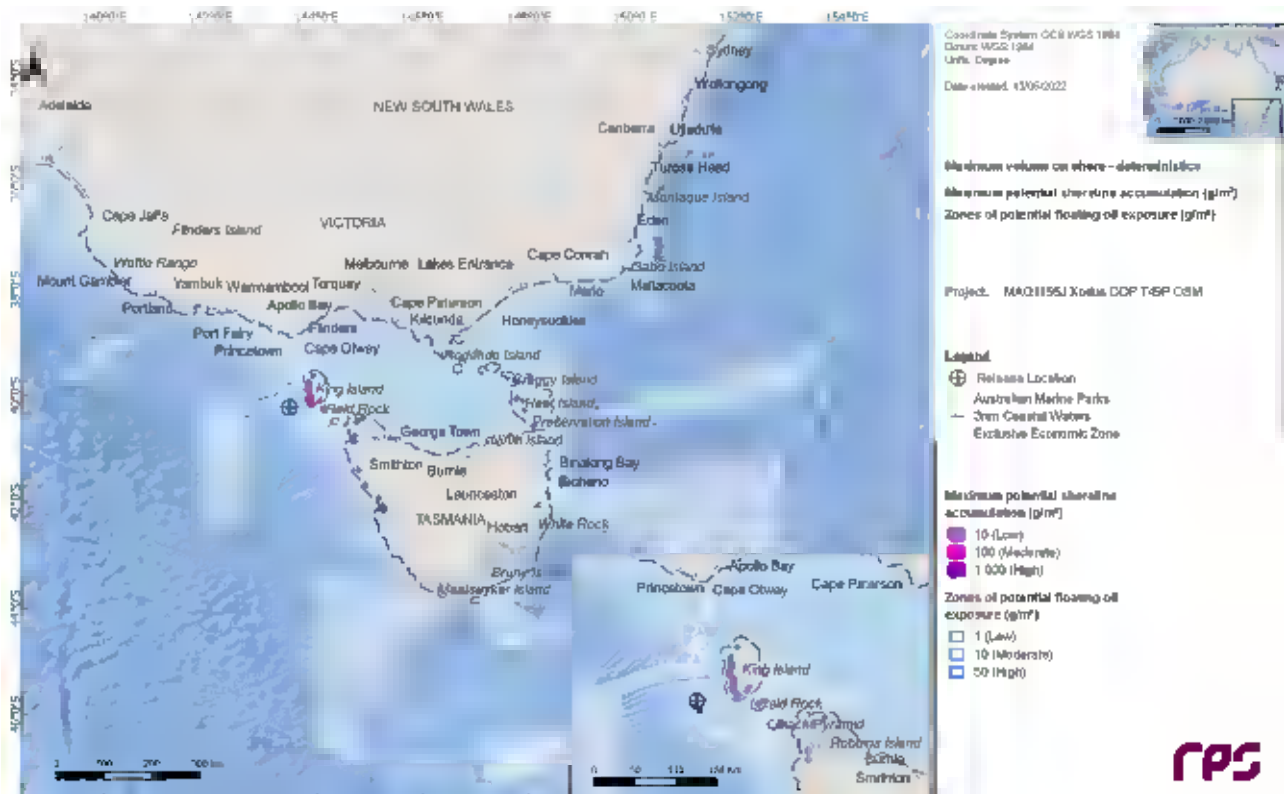


Figure 15.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

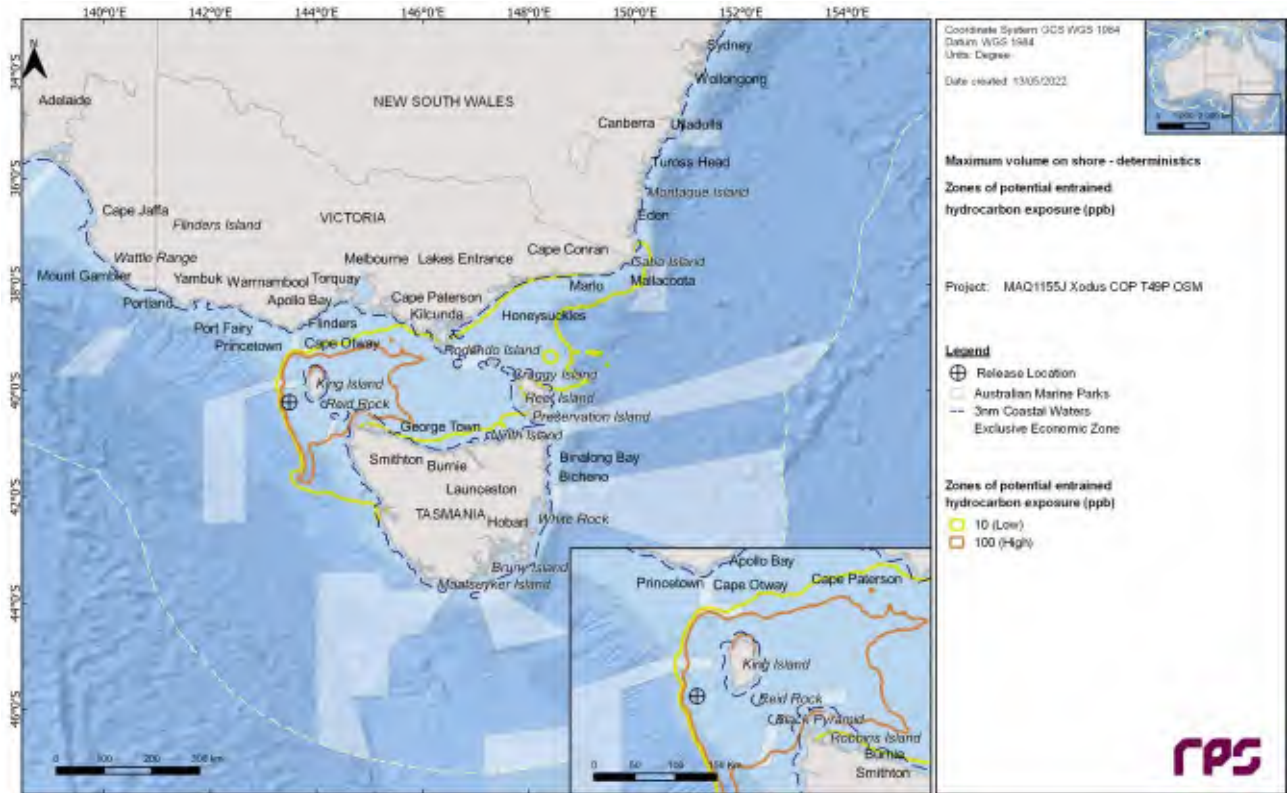


Figure 15.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

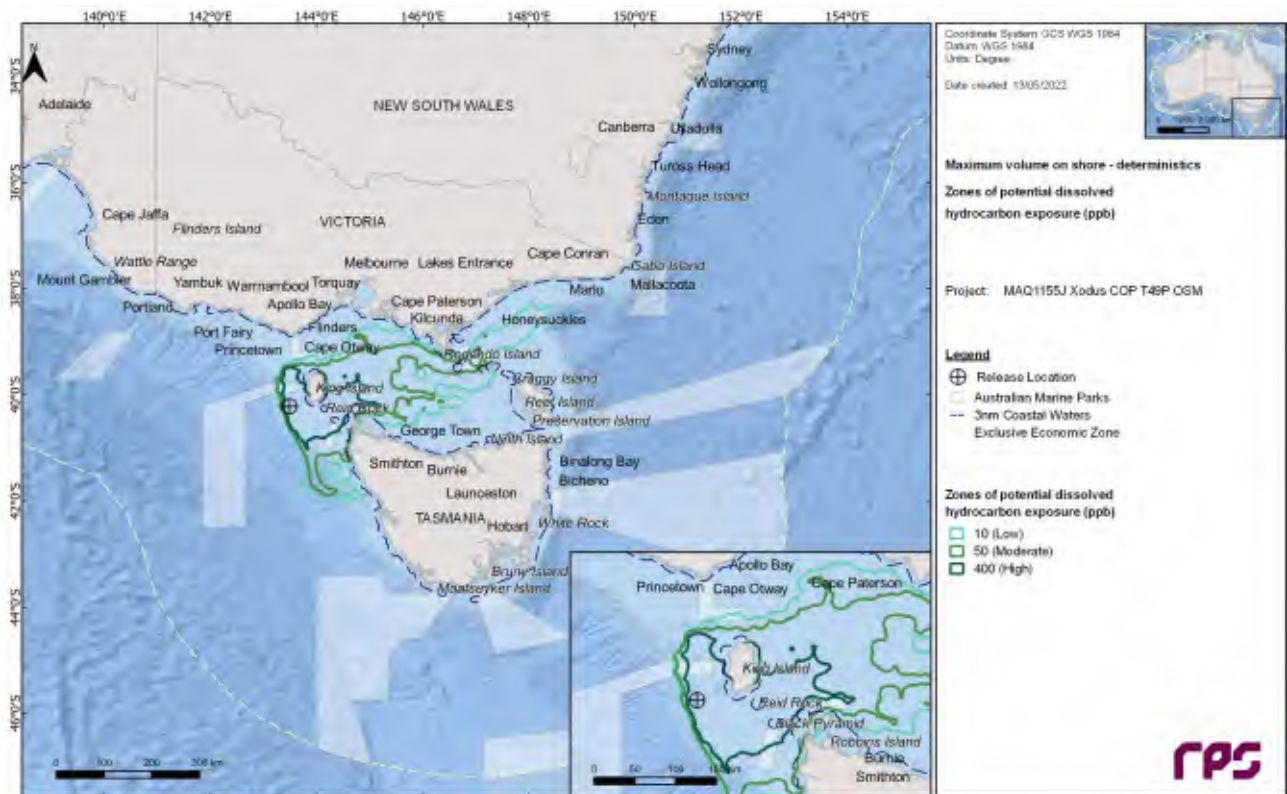


Figure 15.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

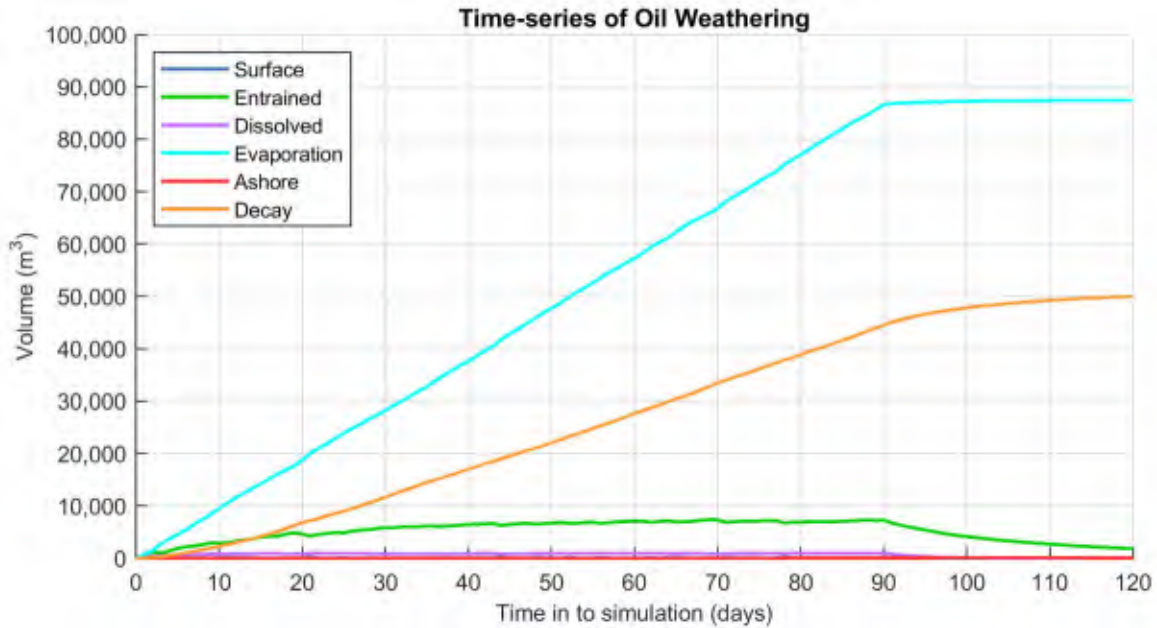


Figure 15.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

15.3.2 Largest Area of Floating Oil Exposure

The simulation that resulted in the largest swept area of floating oil exposure at or above the low exposure threshold of 1,405 km² was identified as run number 25 which commenced during winter conditions, 8 pm 4th July 2017.

Figure 15.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days).

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 15.11 and Figure 15.12, respectively.

Figure 15.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 88,450 m³ (~63%) was lost to the atmosphere through evaporation. Approximately, 49,200 m³ (~35%) of the released volume decayed, while approximately 1,700 m³ (~1%) was predicted to remain within the water column and approximately 27 m³ (<0.1%) remained on shorelines.

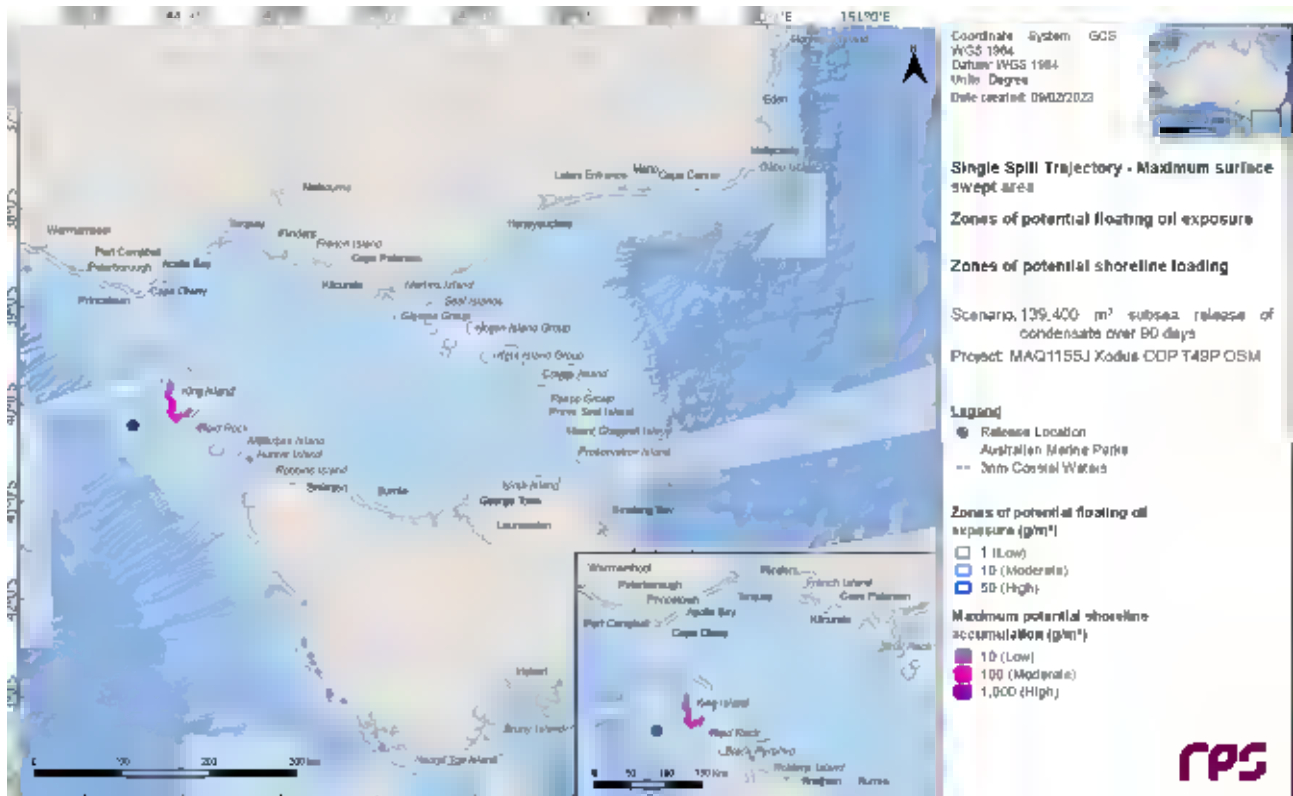


Figure 15.14 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days for the simulation that led to the largest area of floating hydrocarbon exposure from a subsea LOWC at Location 3.

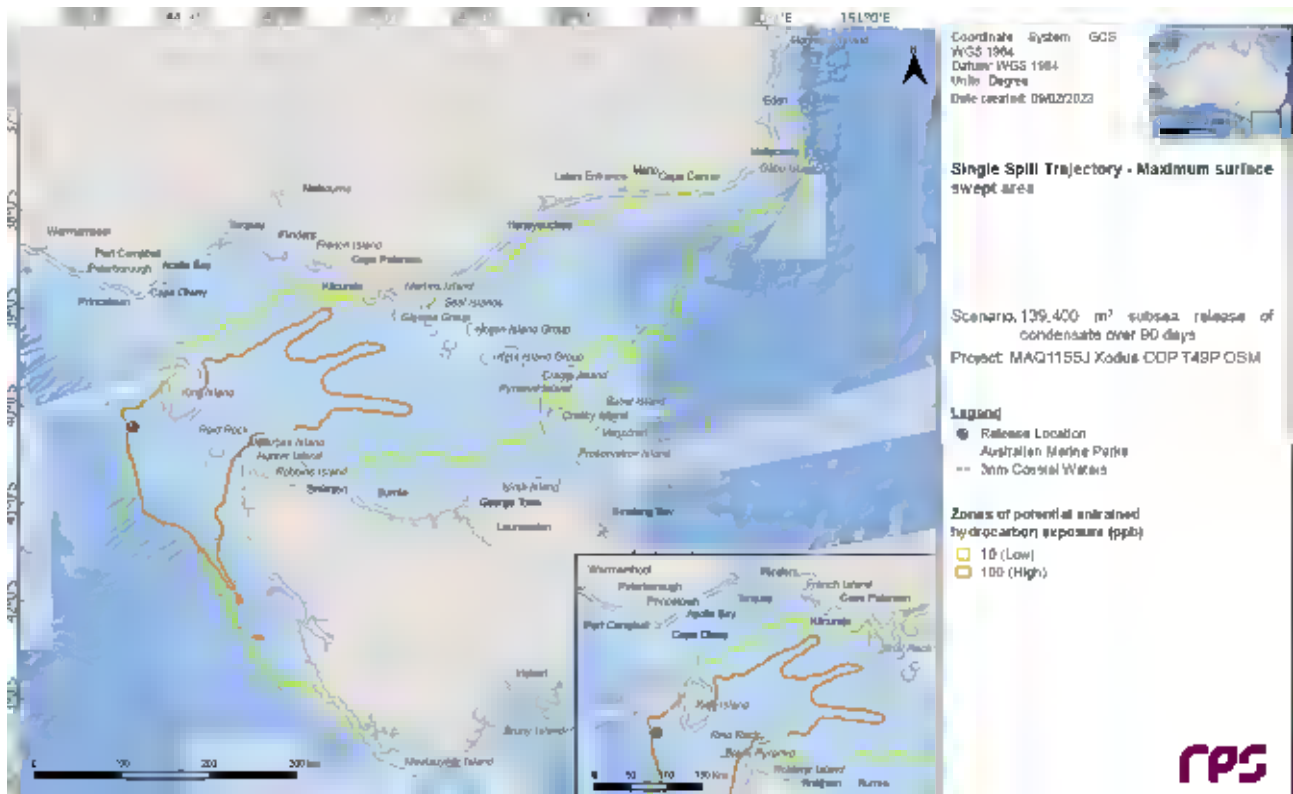


Figure 15.15 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the largest area of floating hydrocarbon exposure from a subsea LOWC at Location 3.

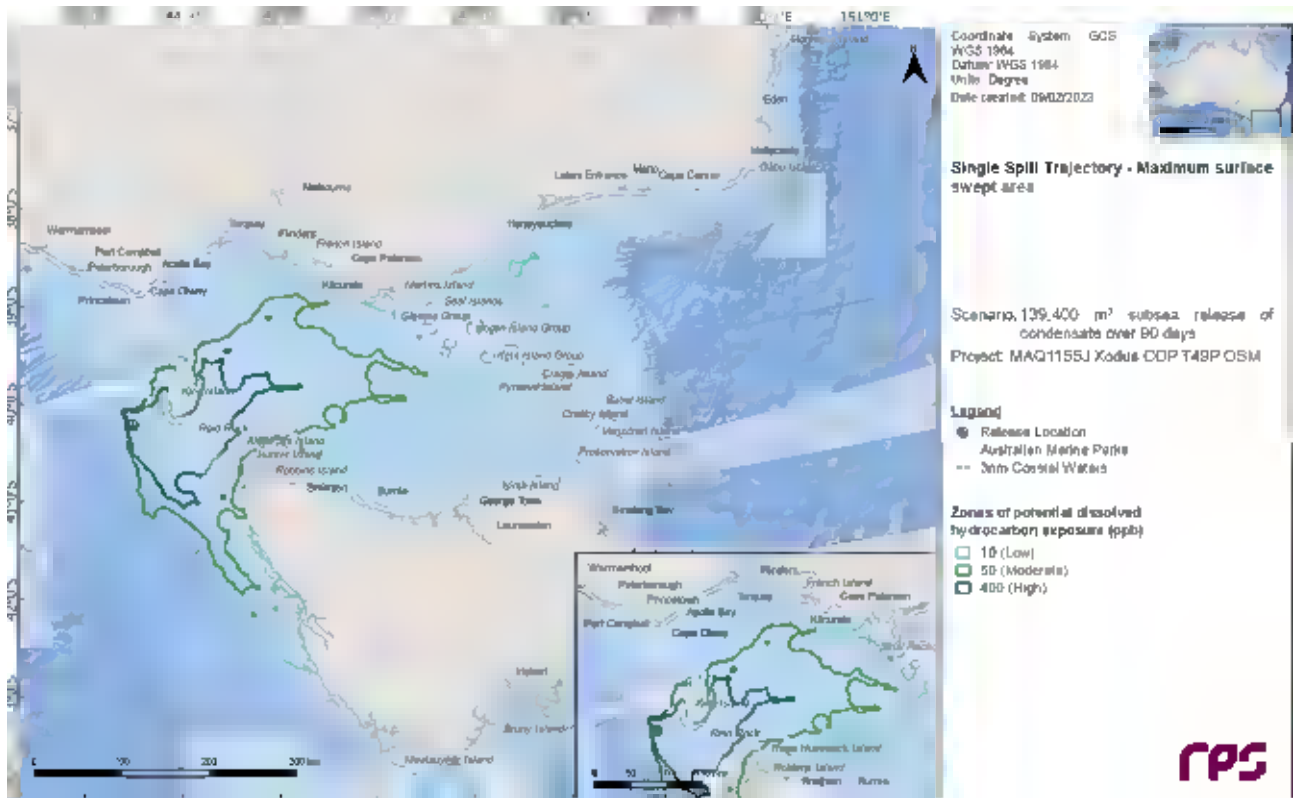


Figure 15.16 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the largest area of floating hydrocarbon exposure from a subsea LOWC at Location 3.

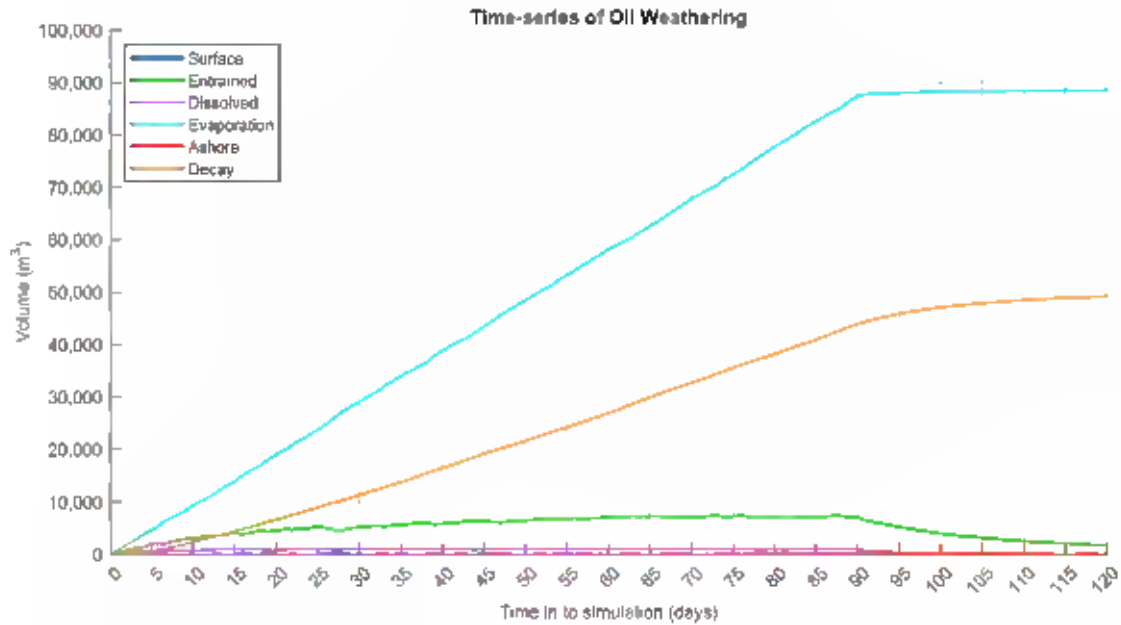


Figure 15.17 Predicted weathering and fates for the simulation that led to the largest area of floating hydrocarbon exposure from a subsea LOWC at Location 3.

15.3.3 Longest Length of Shoreline Accumulation

The simulation that resulted in the longest length of hydrocarbons ashore of 133 km was identified as run number 99 which commenced during winter conditions, 8 pm 26th April 2018.

Figure 15.18 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 10 of the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 15.19 and Figure 15.20, respectively.

Figure 15.21 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 88,250 m³ (~63%) was lost to the atmosphere through evaporation. Approximately, 48,700 m³ (~35%) of the released volume decayed, while approximately 2,200 m³ (~2%) was predicted to remain within the water column and approximately 30 m³ (<0.1%) remained on shorelines.

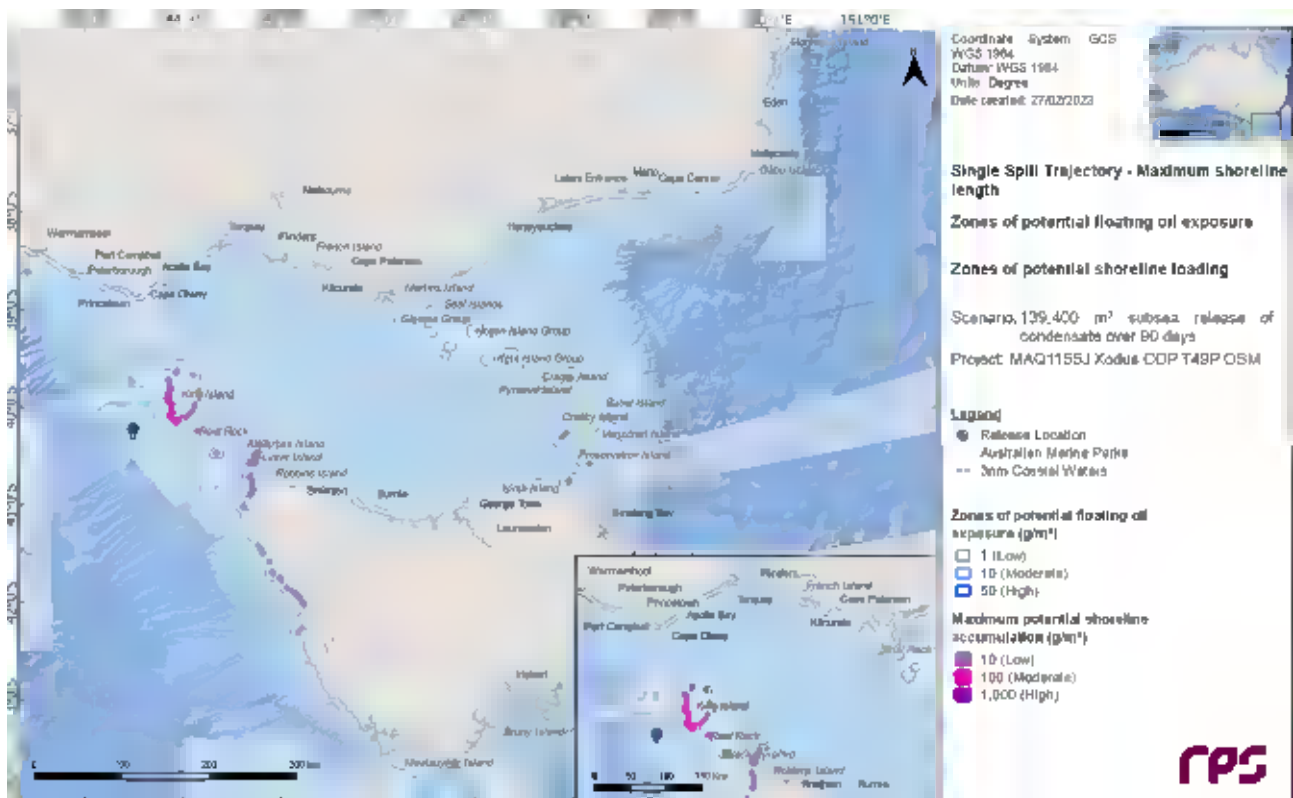


Figure 15.18 Predicted extent of the floating hydrocarbon exposure and shoreline loading over the entire 120 days for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

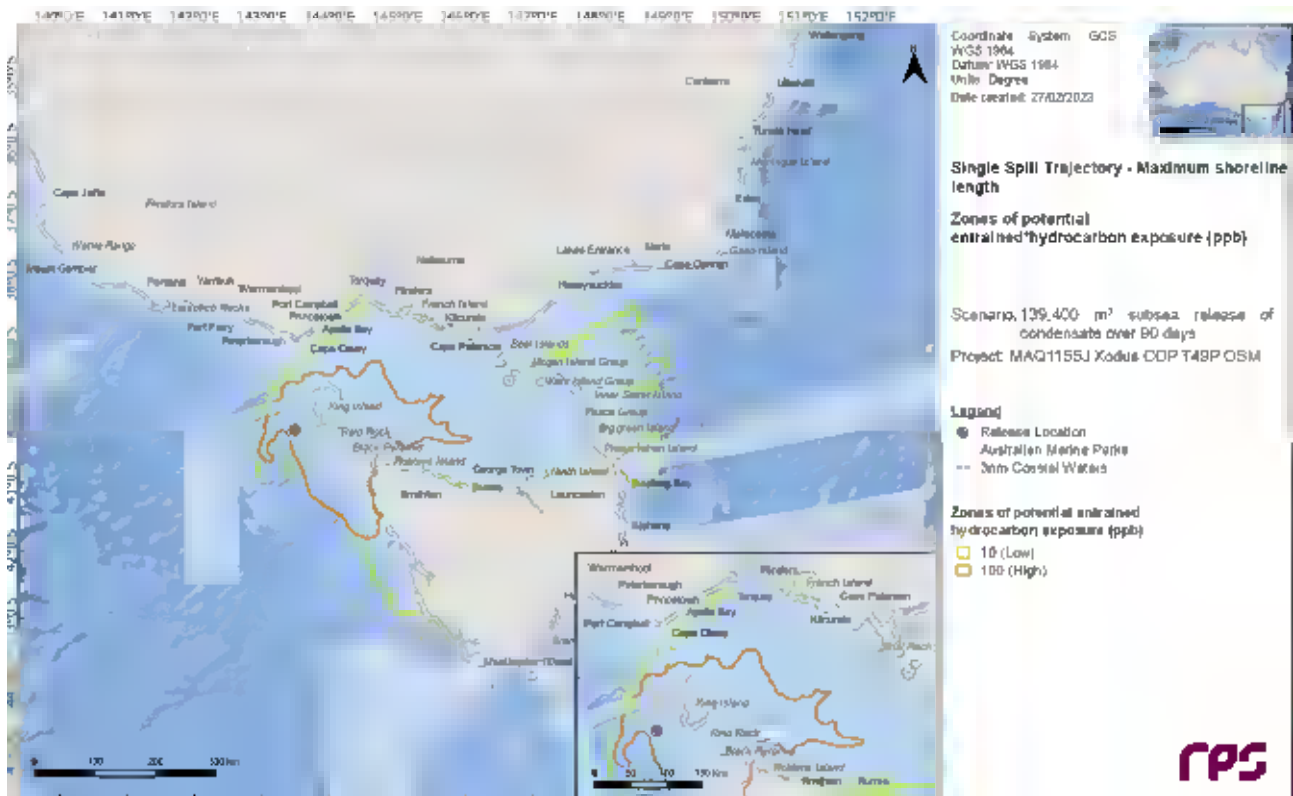


Figure 15.19 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

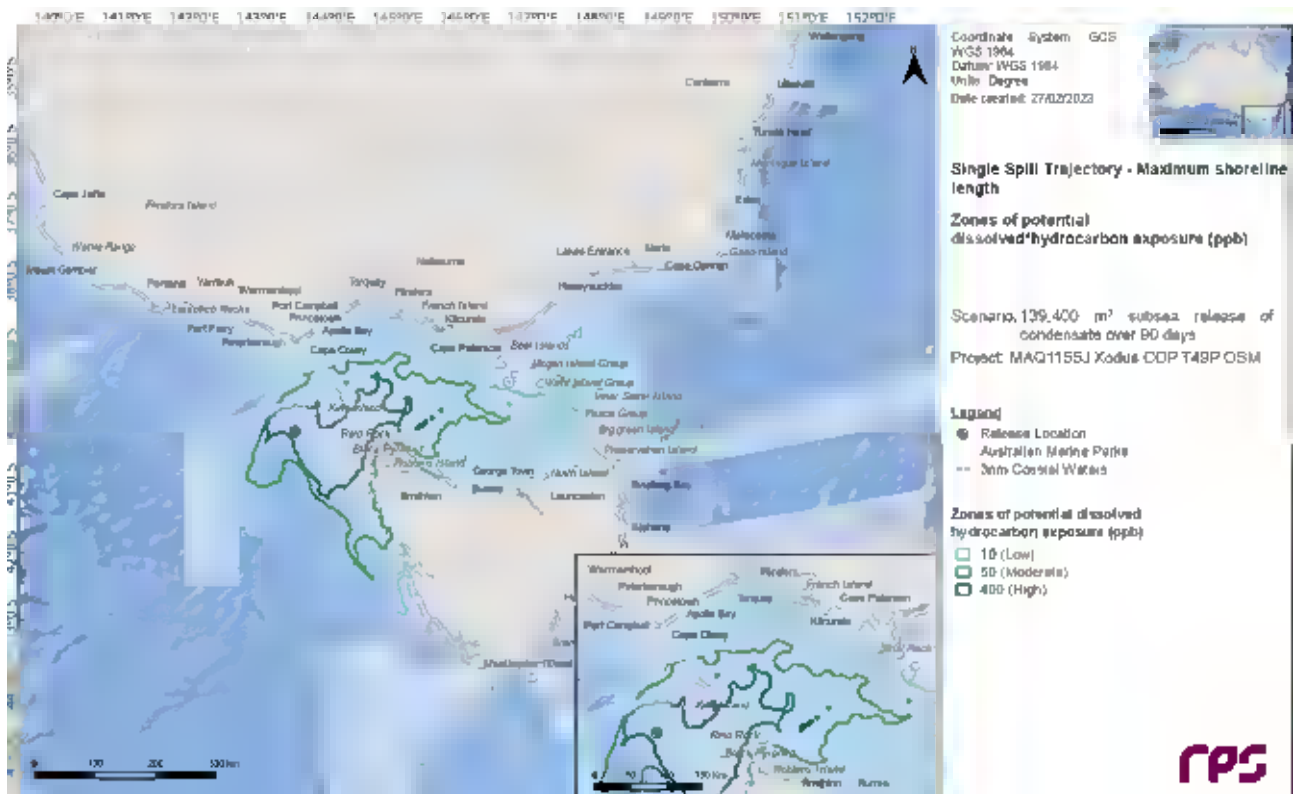


Figure 15.20 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

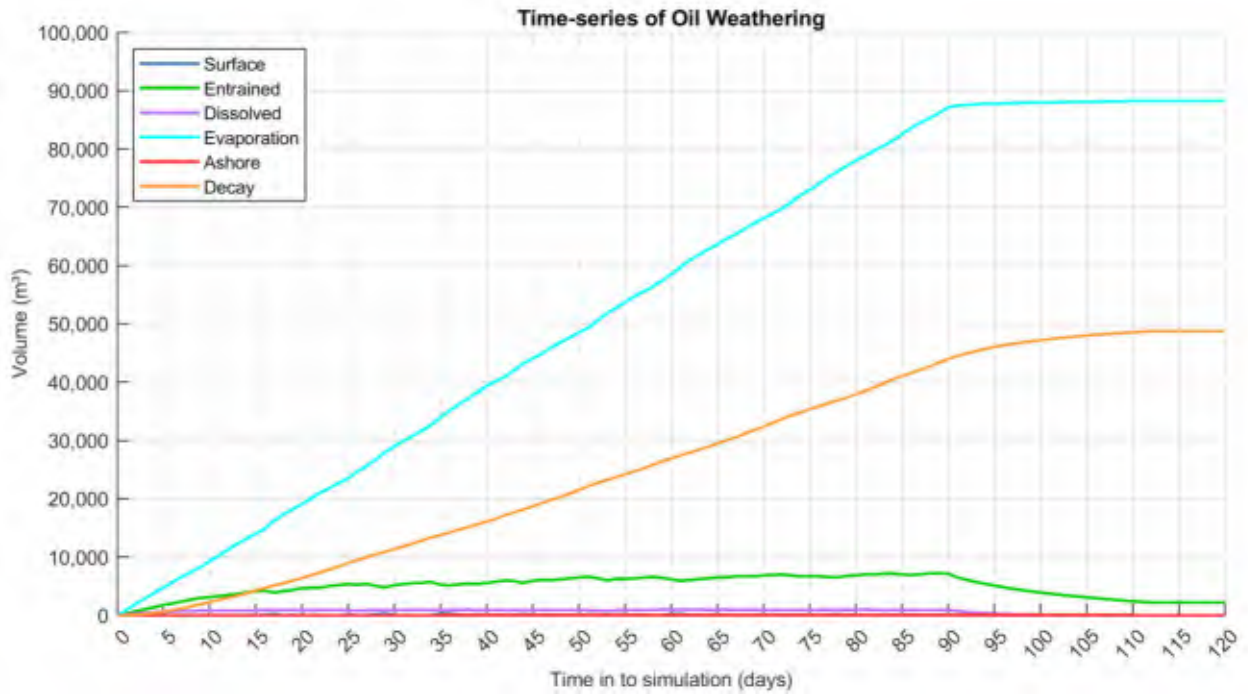


Figure 15.21 Predicted weathering and fates for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

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17 APPENDIX A

17.1 Location 1

17.1.1 Floating Oil Exposure

Table 17-1 summarises the potential floating oil exposure to BIAs for each season.

Table 17-1 Summary of the potential exposure by floating oil to BIAs from a subsea LOWC at Location 1 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter					
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Antipodean Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Australasian Gannet - Foraging	-	-	-	-	-	-	-	-	-	-	-	-
Black-browed Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Black-faced Cormorant - Foraging	2	-	-	84.83	-	-	31	-	-	2.71	-	-
Bullers Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Campbell Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Common Diving-petrel - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Grey Nurse Shark - Foraging	-	-	-	-	-	-	-	-	-	-	-	-
Humpback Whale - Foraging	-	-	-	-	-	-	-	-	-	-	-	-
Indian Yellow-nosed Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Little Penguin - Foraging	1	-	-	90.25	-	-	21	-	-	2.71	-	-
Pygmy Blue Whale - Distribution	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Pygmy Blue Whale - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Short-tailed Shearwater - Breeding	-	-	-	-	-	-	-	-	-	-	-	-
Short-tailed Shearwater - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Shy Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-

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Southern Right Whale - Aggregation	-	-	-	-	-	-	-	-	-	-	-	-
Southern Right Whale - Connecting Habitat	-	-	-	-	-	-	14	-	-	24.63	-	-
Southern Right Whale - Migration	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Wandering Albatross - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Wedge-tailed Shearwater - Foraging	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
White Shark - Breeding	-	-	-	-	-	-	-	-	-	-	-	-
White Shark - Distribution	100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
White Shark - Foraging	1	-	-	94.21	-	-	13	-	-	10.08	-	-
White-faced Storm-petrel - Foraging	90	-	-	2.54	-	-	99	-	-	1.63	-	-

17.1.2 In-water exposure

17.1.2.1 Dissolved Hydrocarbons

Table 17-2 summarises the potential exposure to BIAs from dissolved hydrocarbons in the 0 – 10 m depth layer for each threshold and season.

Figure 17.1 to Figure 17.6 illustrate the extent of dissolved hydrocarbon exposure in the 10-20 m, 20 – 30 m and 30 – 50 m depth layers for each season.

Table 17-2 Probability of dissolved hydrocarbons exposure to BIAs in the 0-10 m depth layer from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter				
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
		Low	Mod erate	High		Low	Mode rate	High
Antipodean Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Australasian Gannet - Foraging	635	37	10	1	497	48	11	1
Black Petrel - Foraging	7	-	-	-	58	5	1	-
Black-browed Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Black-faced Cormorant - Foraging	1,866	82	66	10	2,217	92	81	28
Bullers Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Campbell Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Common Diving-petrel - Foraging	7,731	100	100	100	6,003	100	100	100
Crested Tern - Breeding	3	-	-	-	70	4	1	-
BIA Crested Tern - Foraging	6	-	-	-	63	5	1	-
Flesh-footed Shearwater - Foraging	7	-	-	-	58	5	1	-
Great-winged Petrel - Foraging	2	-	-	-	20	2	-	-
Grey Nurse Shark - Foraging	142	4	3	-	73	6	1	-
Grey Nurse Shark - Migration	79	3	1	-	61	6	1	-
Humpback Whale - Foraging	142	4	3	-	120	10	2	-
Indian Yellow-nosed Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Indo-Pacific/Spotted Bottlenose Dolphin - Breeding	142	4	2	-	120	11	1	-
Little Penguin - Breeding	53	6	1	-	122	42	11	-

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Little Penguin - Foraging	1,003	80	57	4	1,887	87	75	18
Northern Giant Petrel - Foraging	2	-	-	-	20	2	-	-
Pygmy Blue Whale - Distribution	7,731	100	100	100	6,003	100	100	100
Pygmy Blue Whale - Foraging	7,731	100	100	100	6,003	100	100	100
Short-tailed Shearwater - Breeding	246	56	28	-	460	80	49	2
Short-tailed Shearwater - Foraging	7,731	100	100	100	6,003	100	100	100
Shy Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Soft-plumaged Petrel - Foraging	43	3	-	-	2	-	-	-
Sooty Shearwater - Foraging	109	3	3	-	73	6	1	-
Southern Giant Petrel - Foraging	2	-	-	-	20	2	-	-
Southern Right Whale - Aggregation	425	22	9	1	615	10	10	1
Southern Right Whale - Connecting Habitat	727	66	35	2	2,106	86	65	13
Southern Right Whale - Migration	7,731	100	100	100	6,003	100	100	100
Wandering Albatross - Foraging	7,731	100	100	100	6,003	100	100	100
Wedge-tailed Shearwater - Foraging	7,731	100	100	100	6,003	100	100	100
White Shark - Breeding	831	12	4	1	1,197	48	8	1
White Shark - Distribution	7,731	100	100	100	6,003	100	100	100
White Shark - Foraging	764	53	20	1	1,386	85	44	3
White-capped Albatross - Foraging	2	-	-	-	20	2	-	-
White-faced Storm-petrel - Breeding	72	2	1	-	70	5	1	-
White-faced Storm-petrel - Foraging	3,730	97	96	52	2,898	100	100	53
Wilson's Storm Petrel - Migration	2	-	-	-	20	2	-	-

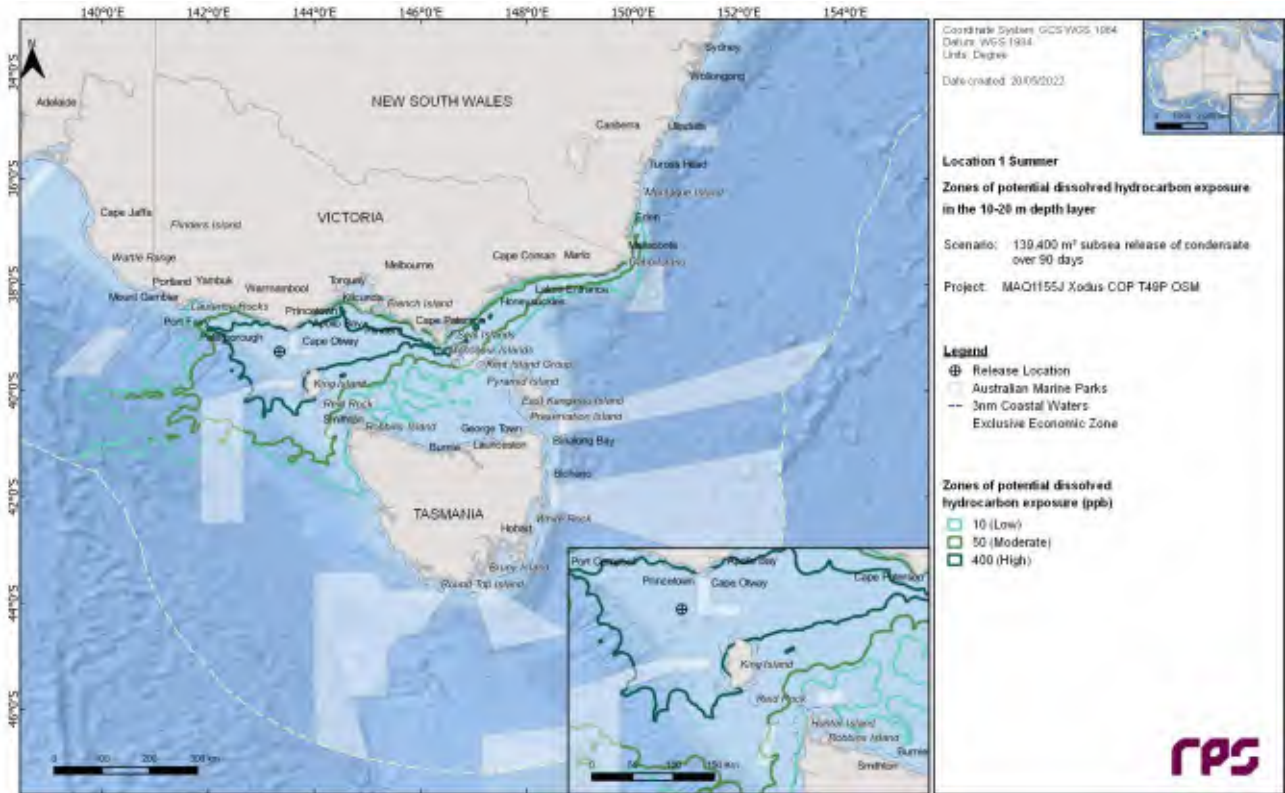


Figure 17.1 Zones of potential dissolved hydrocarbon exposure at 10-20 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

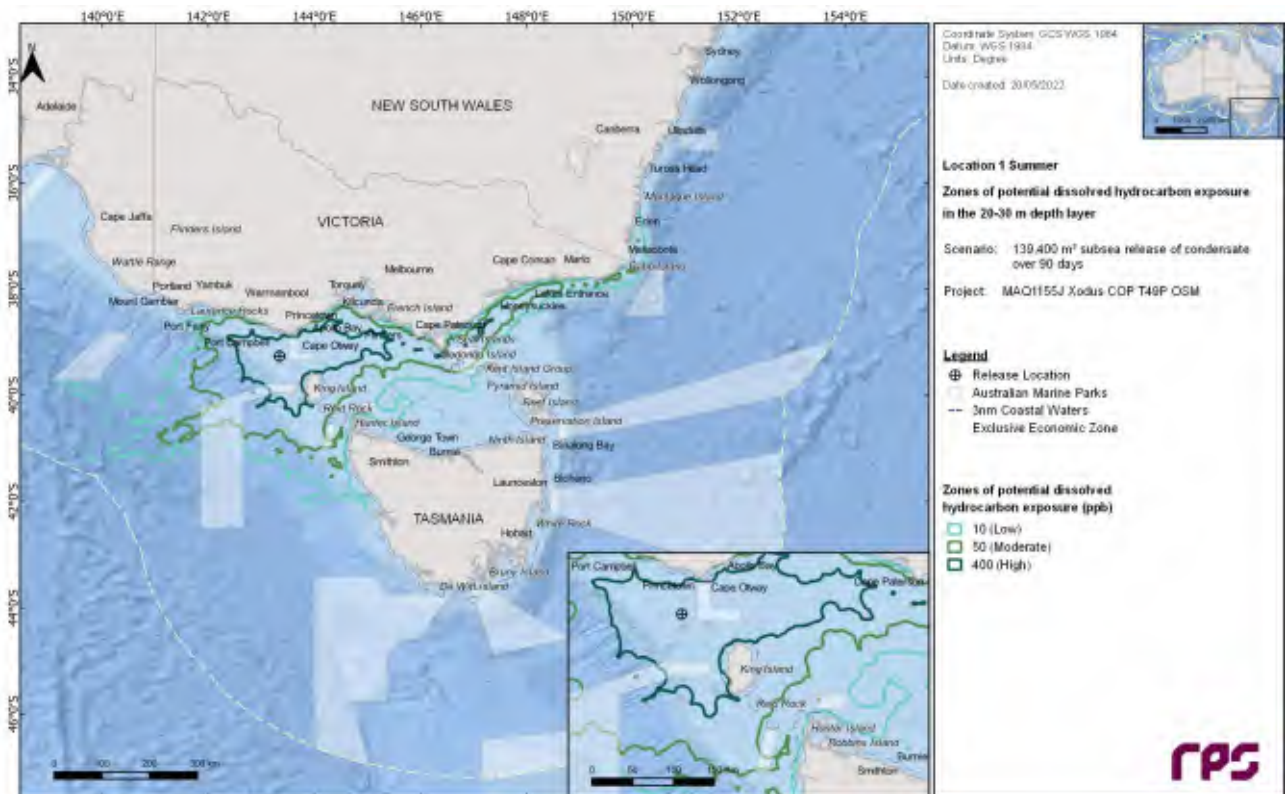


Figure 17.2 Zones of potential dissolved hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

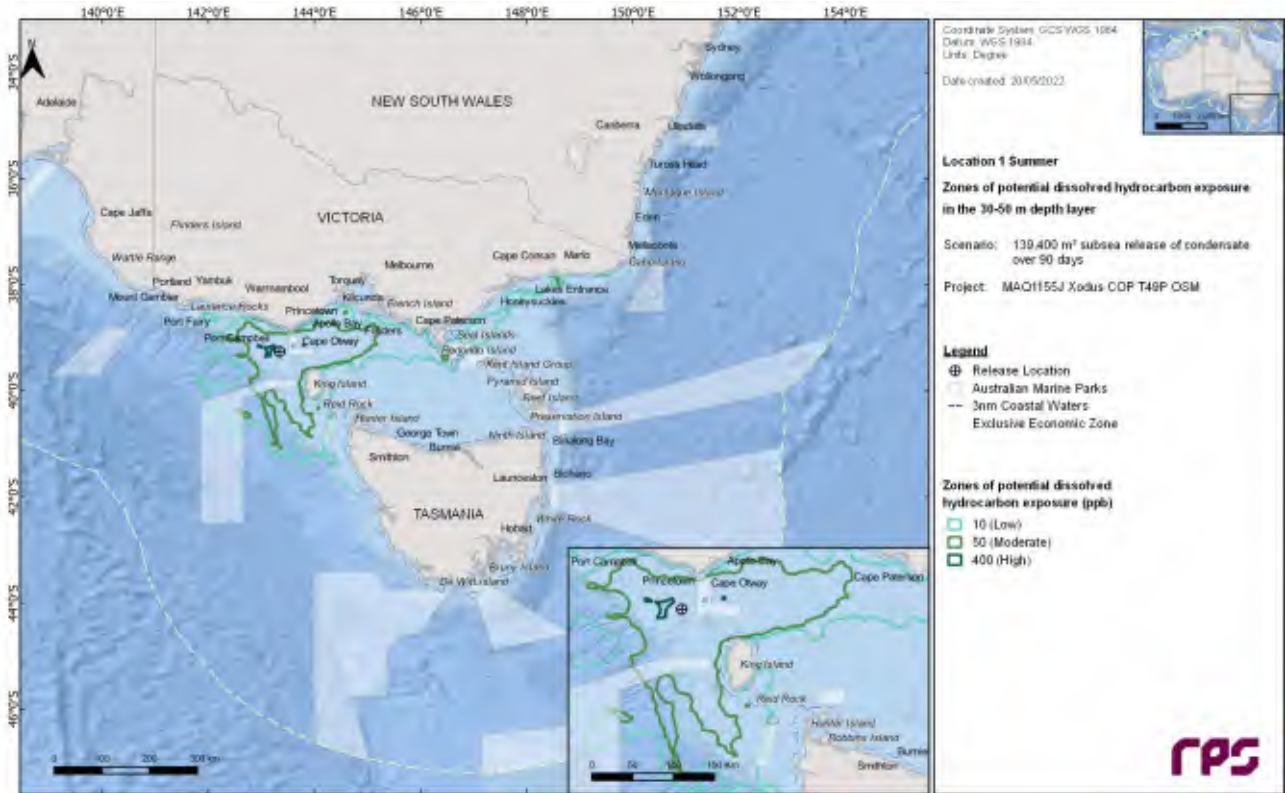


Figure 17.3 Zones of potential dissolved hydrocarbon exposure at 30 - 50 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

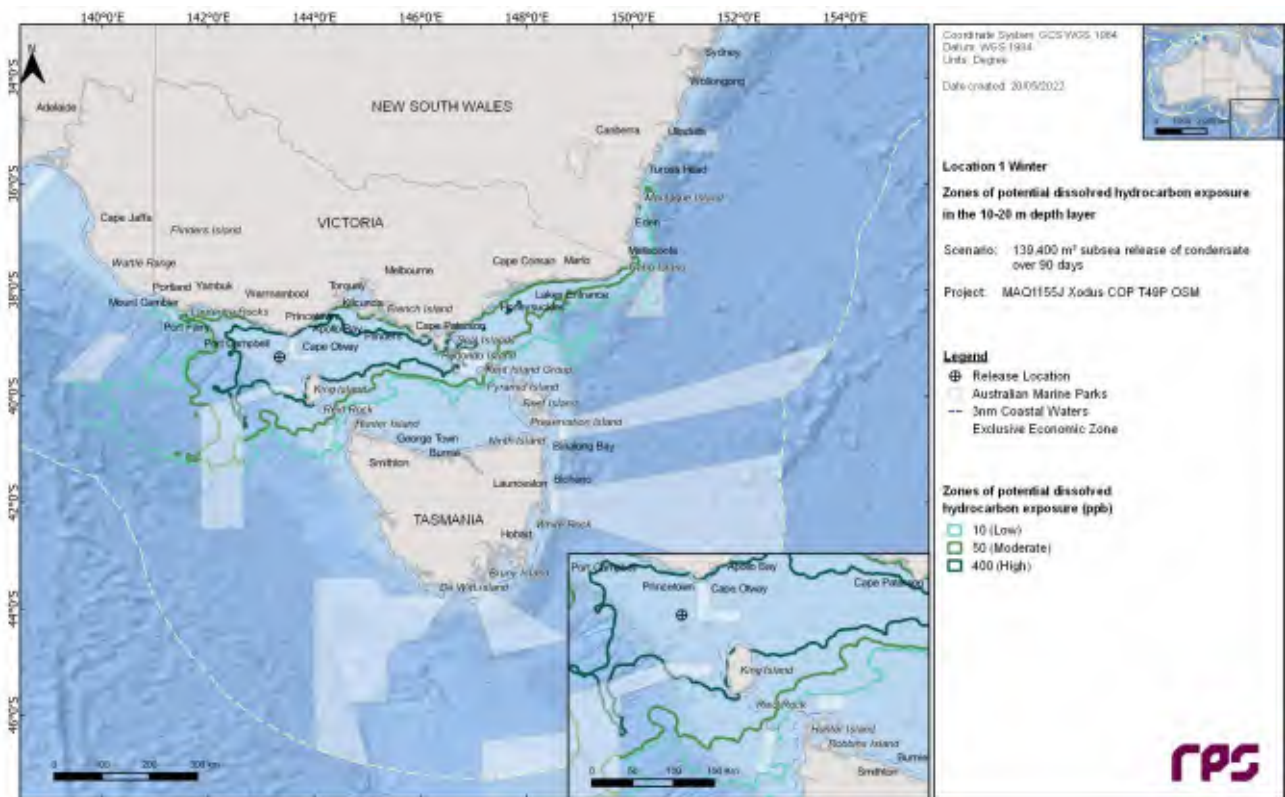


Figure 17.4 Zones of potential dissolved hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

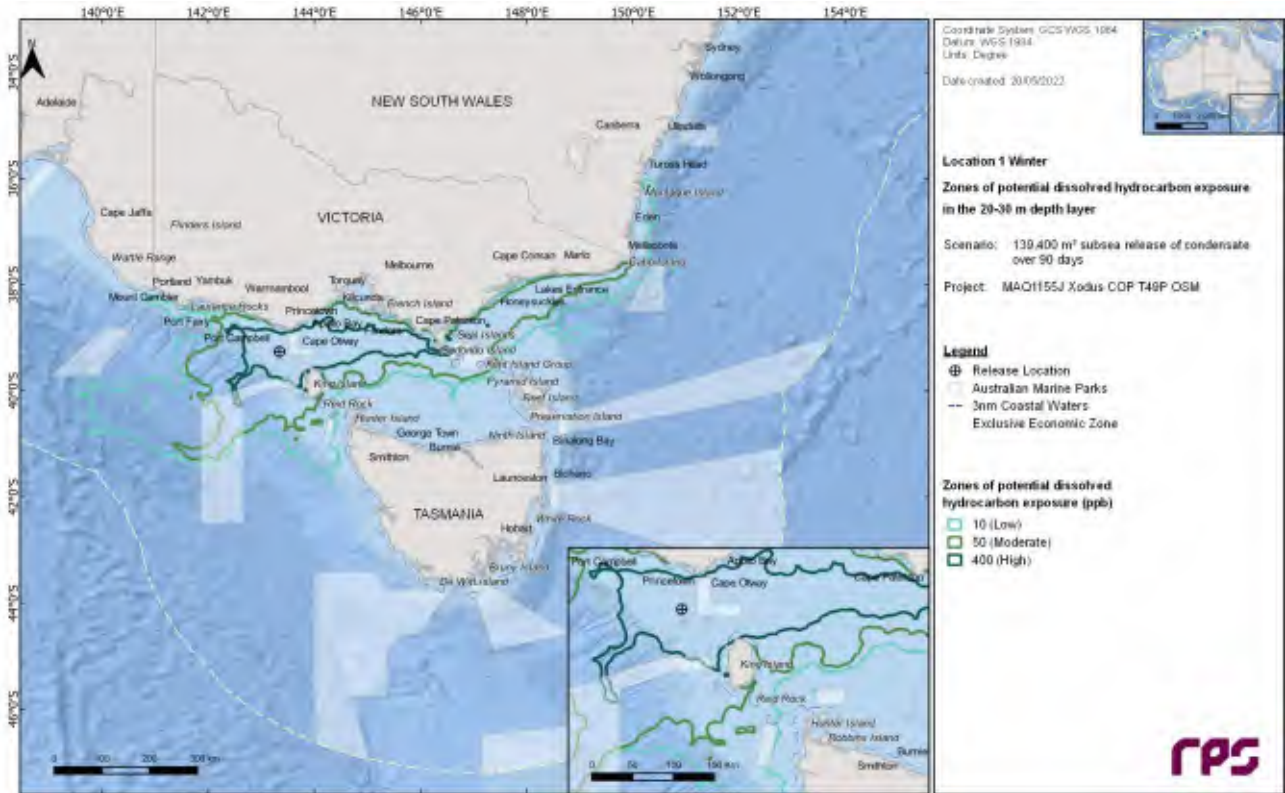


Figure 17.5 Zones of potential dissolved hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

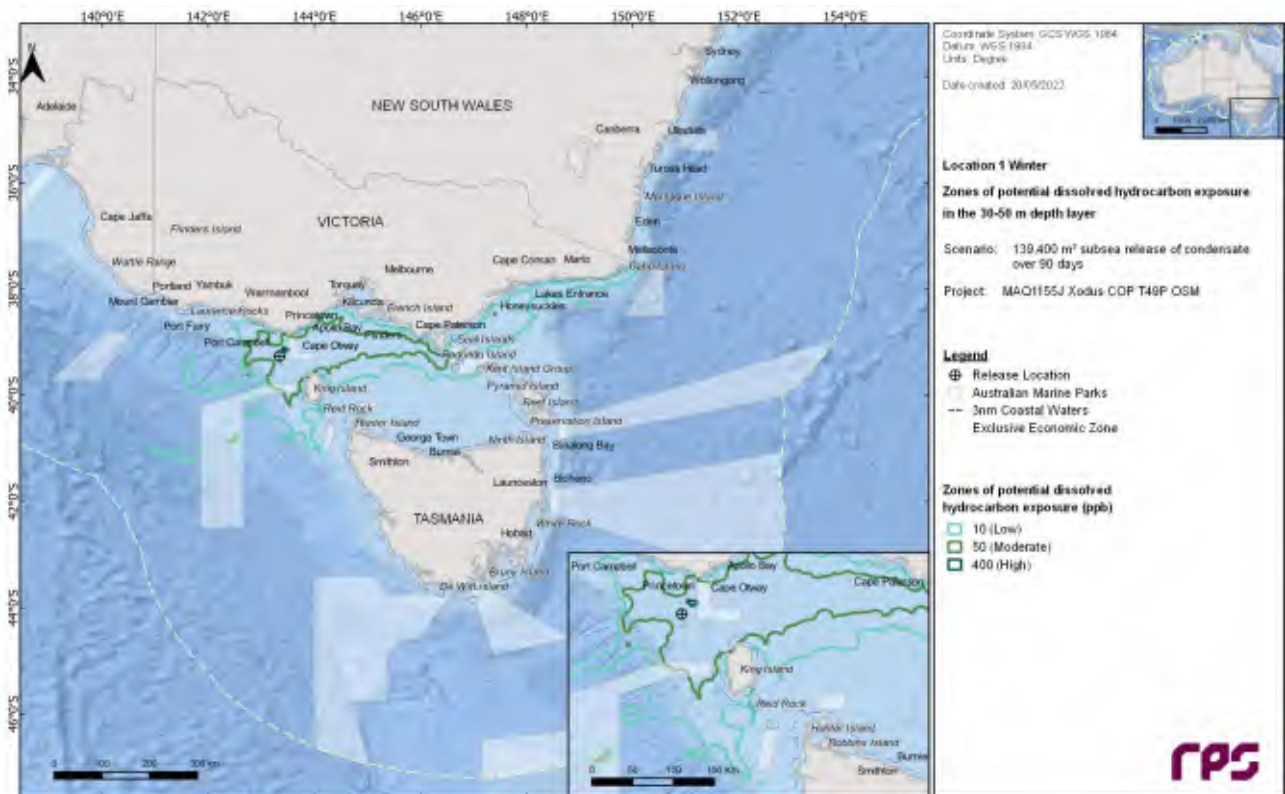


Figure 17.6 Zones of potential dissolved hydrocarbon exposure at 30 - 50 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

17.1.2.2 Entrained Hydrocarbons

Table 17-3 summarises the potential exposure to BIAs from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 17.7 to Figure 17.10 illustrate extent of entrained hydrocarbon exposure for each season in the 10 - 20 m and 20 – 30 m depth layers.

Table 17-3 Probability of entrained hydrocarbons exposure to BIAs in the 0-10 m depth layer from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter		
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
		Low	High		Low	High
Antipodean Albatross - Foraging	11,005	100	100	11,153	100	100
Australasian Gannet - Foraging	391	81	22	352	77	20
Australian Sea Lion - Foraging	12	2	-	3	-	-
Black Petrel - Foraging	40	11	-	61	39	-
Black-browed Albatross - Foraging	11,005	100	100	11,153	100	100
Black-faced Cormorant - Foraging	857	99	70	1,259	98	91
Bullers Albatross - Foraging	11,005	100	100	11,153	100	100
Campbell Albatross - Foraging	11,005	100	100	11,153	100	100
Common Diving-petrel - Foraging	11,005	100	100	11,153	100	100
Crested Tern - Breeding	32	6	-	38	30	-
Crested Tern - Foraging	36	9	-	45	34	-
Flesh-footed Shearwater - Foraging	40	11	-	61	39	-
Great-winged Petrel - Foraging	40	9	-	61	27	-
Grey Nurse Shark - Foraging	183	28	5	190	80	5
Grey Nurse Shark - Migration	267	28	6	269	79	5
Humpback Whale - Foraging	267	28	6	269	82	5
Indian Yellow-nosed Albatross - Foraging	11,005	100	100	11,153	100	100
Indo-Pacific/Spotted Bottlenose Dolphin - Breeding	78	27	-	79	80	-
Little Penguin - Breeding	104	46	1	258	84	22
Little Penguin - Foraging	661	96	68	1,259	97	90
Northern Giant Petrel - Foraging	40	9	-	61	27	-
Pygmy Blue Whale - Distribution	11,005	100	100	11,153	100	100
Pygmy Blue Whale - Foraging	11,005	100	100	11,153	100	100
Short-tailed Shearwater - Breeding	426	89	38	711	97	75
Short-tailed Shearwater - Foraging	11,005	100	100	11,153	100	100
Shy Albatross - Foraging	11,005	100	100	11,153	100	100
Soft-plumaged Petrel - Foraging	45	42	-	18	6	-
Sooty Shearwater - Foraging	267	28	6	269	74	5
Southern Giant Petrel - Foraging	40	9	-	61	27	-

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Southern Right Whale - Aggregation	426	59	29	348	25	9
Southern Right Whale - Connecting Habitat	998	93	53	1,054	98	78
Southern Right Whale - Migration	11,005	100	100	11,153	100	100
Wandering Albatross - Foraging	11,005	100	100	11,153	100	100
Wedge-tailed Shearwater - Foraging	11,005	100	100	11,153	100	100
White Shark - Breeding	130	52	4	141	92	10
White Shark - Distribution	11,005	100	100	11,153	100	100
White Shark - Foraging	1,037	92	35	960	100	61
White-capped Albatross - Foraging	40	9	-	61	27	-
White-faced Storm-petrel - Breeding	203	25	5	200	59	3
White-faced Storm-petrel - Foraging	1,720	100	97	1,477	100	100
White-fronted Tern - Foraging	13	3	-	7	--	-
Wilson's Storm Petrel - Migration	40	9	-	61	27	-

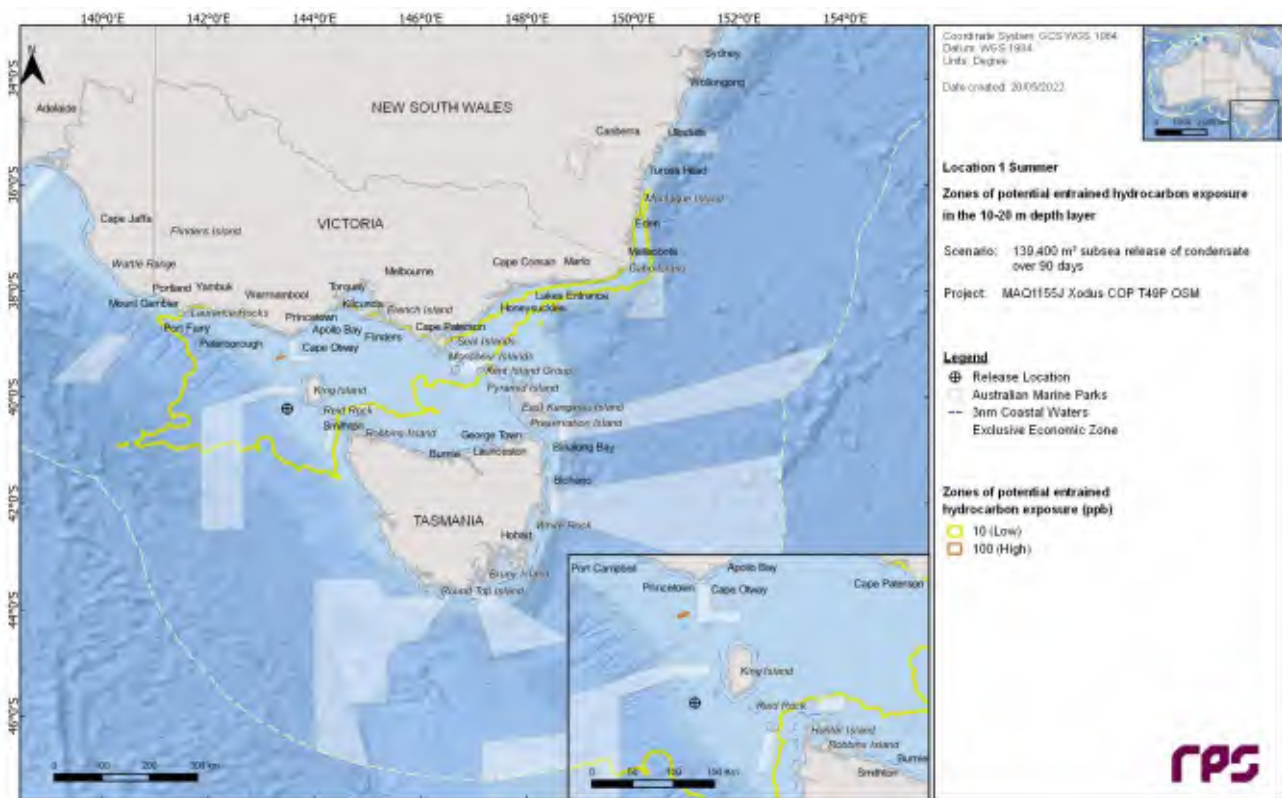


Figure 17.7 Zones of potential entrained hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

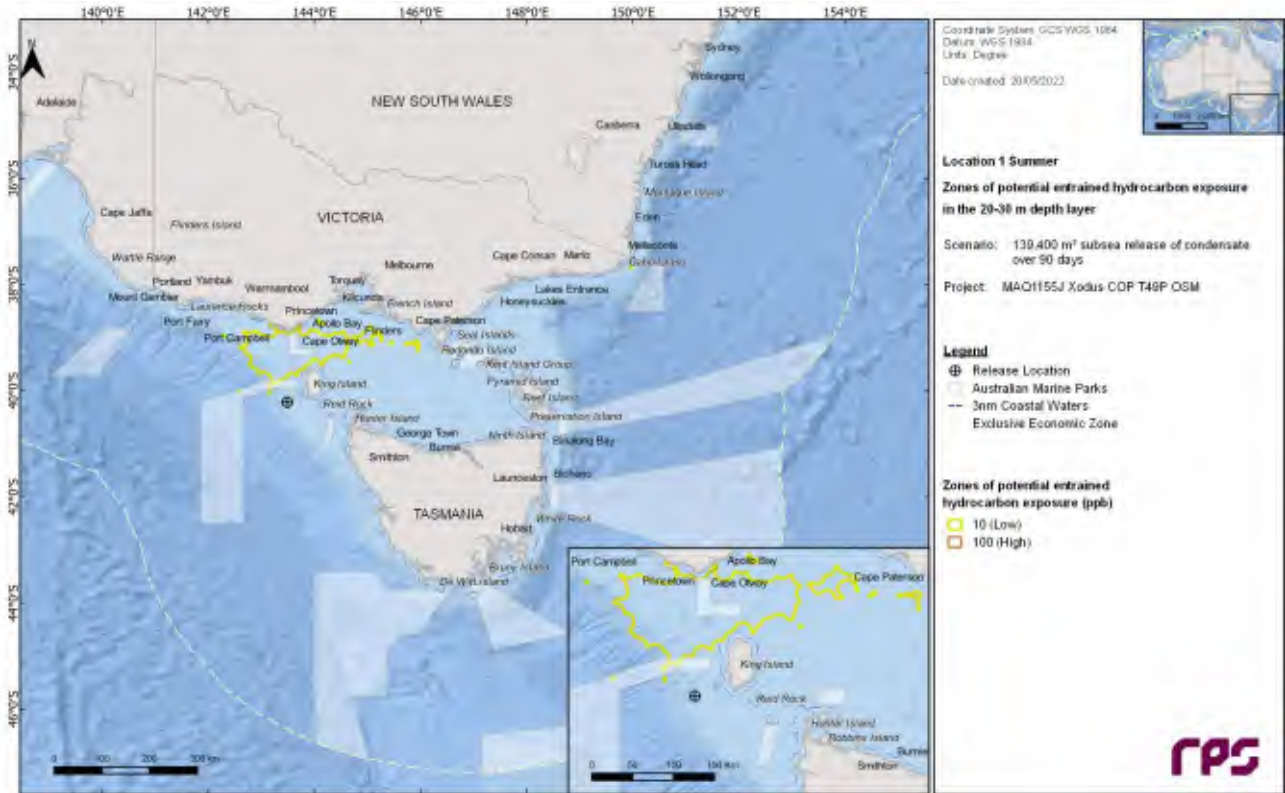


Figure 17.8 Zones of potential entrained hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

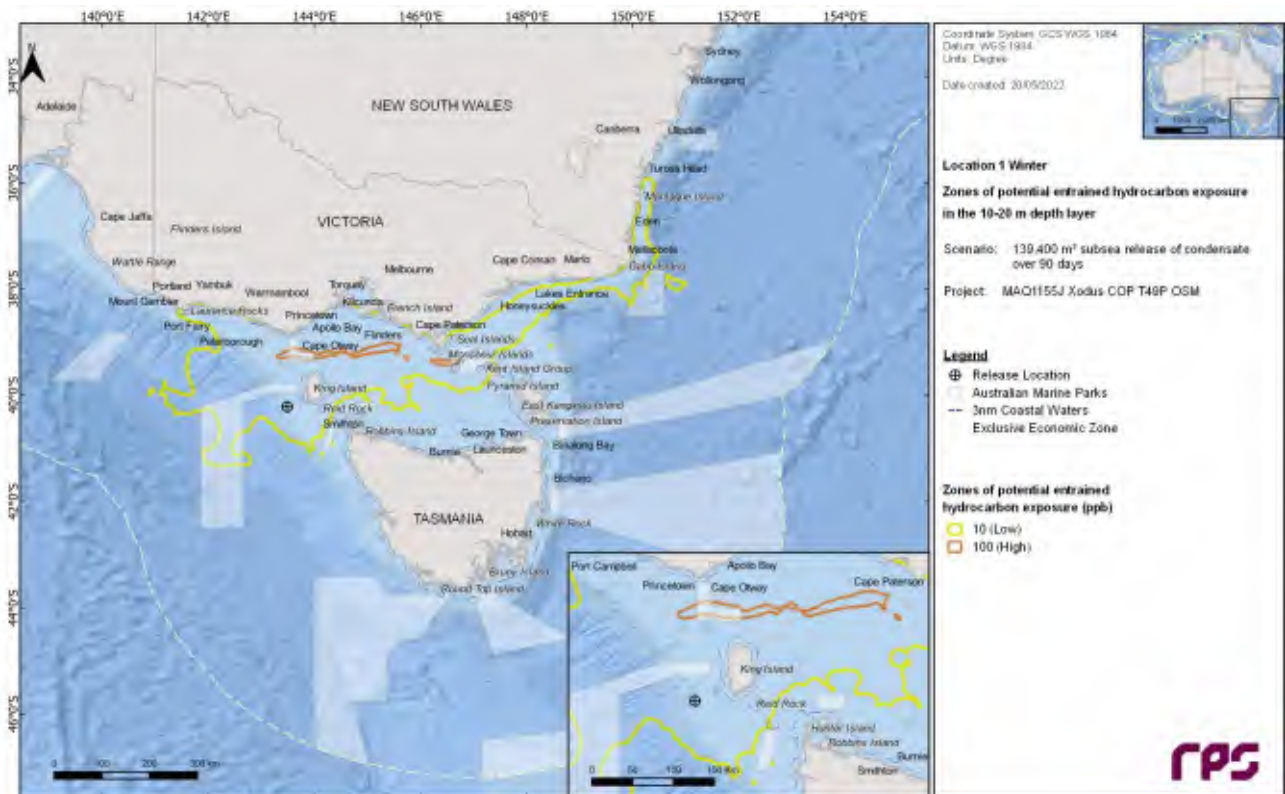


Figure 17.9 Zones of potential entrained hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

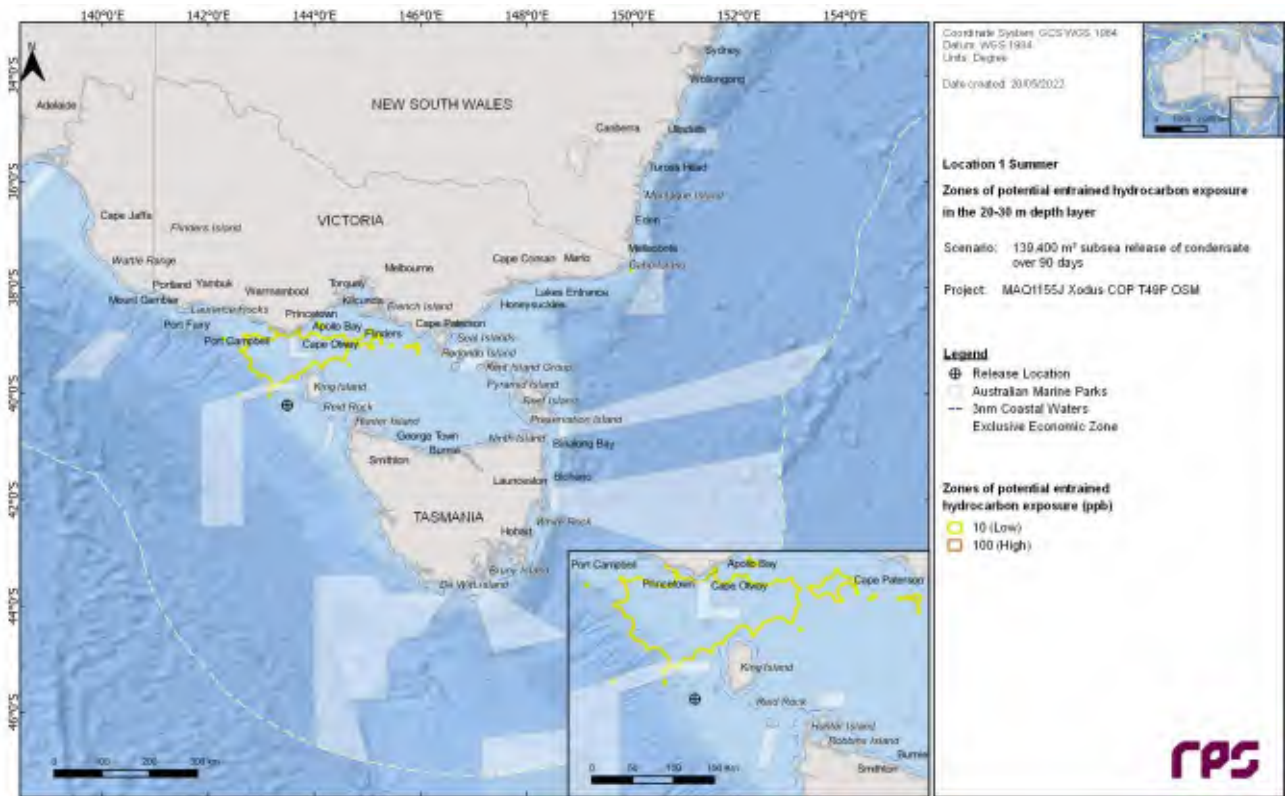


Figure 17.10 Zones of potential entrained hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

17.2 Location 2

17.2.1 Floating Oil Exposure

Table 17-4 summarises the potential floating oil exposure to BIAs for each season.

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Table 17-4 Summary of the potential exposure by floating oil to BIAs from a subsea LOWC at Location 2 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter					
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Antipodean Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Australasian Gannet - Foraging	1	-	-	84.33	-	-	37	-	-	5.17	-	-
Black-browed Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Black-faced Cormorant - Foraging	98	-	-	1	-	-	100	-	-	0.88	-	-
Bullers Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Campbell Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Common Diving-petrel - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Indian Yellow-nosed Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Little Penguin - Foraging	88	-	-	1.17	-	-	100	-	-	1.08	-	-
BIA Pygmy Blue Whale - Distribution	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Pygmy Blue Whale - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Short-tailed Shearwater - Breeding	3	-	-	63	-	-	2	-	-	12.21	-	-
Short-tailed Shearwater - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Shy Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Southern Right Whale - Connecting Habitat	97	-	-	2.29	-	-	100	-	-	1.17	-	-
Southern Right Whale - Migration	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Wandering Albatross - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
Wedge-tailed Shearwater - Foraging	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
White Shark - Breeding	-	-	-	-	-	-	-	-	-	-	-	-

REPORT

White Shark - Distribution	100	100	1	0.04	0.08	48.92	100	100	1	0.04	0.08	79.88
White Shark - Foraging	63	-	-	2.67	-	-	97	-	-	1.46	-	-
White-faced Storm-petrel - Foraging	99	-	-	0.92	-	-	100	-	-	0.83	-	-

17.2.2 In-water exposure

17.2.2.1 Dissolved Hydrocarbons

Table 17-5 summarises the potential exposure to BIAs from dissolved hydrocarbons in the 0 – 10 m depth layer for each threshold and season.

Figure 17.11 to Figure 17.16 illustrate the extent of dissolved hydrocarbon exposure in the 10-20 m, 20 – 30 m and 30 – 50 m depth layers for each season.

Table 17-5 Probability of dissolved hydrocarbons exposure to BIAs in the 0-10 m depth layer from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter				
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
		Low	Mod erate	High		Low	Mode rate	High
Antipodean Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Australasian Gannet - Foraging	2,512	97	76	8	2,788	100	92	26
Black Petrel - Foraging	3	-	-	-	13	1	-	-
Black-browed Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Black-faced Cormorant - Foraging	6,498	100	100	98	5,377	100	100	100
Bullers Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Campbell Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Common Diving-petrel - Foraging	7,872	100	100	100	9,003	100	100	100
Crested Tern - Foraging	3	-	-	-	13	1	-	-
Flesh-footed Shearwater - Foraging	3	-	-	-	13	1	-	-
Grey Nurse Shark - Foraging	6	-	-	-	44	2	-	-
Grey Nurse Shark - Migration	4	-	-	-	40	1	-	-
Humpback Whale - Foraging	6	-	-	-	44	2	-	-
Indian Yellow-nosed Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Indo-Pacific/Spotted Bottlenose Dolphin - Breeding	6	-	-	-	42	2	-	-
Little Penguin - Breeding	51	4	1	-	91	19	1	-
Little Penguin - Foraging	6,498	100	100	96	4,540	100	100	100
Pygmy Blue Whale - Distribution	7,872	100	100	100	9,003	100	100	100

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Pygmy Blue Whale - Foraging	7,872	100	100	100	9,003	100	100	100
Short-tailed Shearwater - Breeding	1,584	85	68	22	1,798	100	100	46
Short-tailed Shearwater - Foraging	7,872	100	100	100	9,003	100	100	100
Shy Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Soft-plumaged Petrel - Foraging	340	24	5	-	474	19	7	1
Sooty Shearwater - Foraging	20	2	-	-	40	2	-	-
Southern Right Whale - Aggregation	33	1	-	-	9	-	-	-
Southern Right Whale - Connecting Habitat	4,181	100	100	86	4,540	100	100	100
Southern Right Whale - Migration	7,872	100	100	100	9,003	100	100	100
Wandering Albatross - Foraging	7,872	100	100	100	9,003	100	100	100
Wedge-tailed Shearwater - Foraging	7,872	100	100	100	9,003	100	100	100
White Shark - Breeding	121	5	2	-	174	11	2	-
White Shark - Distribution	7,872	100	100	100	9,003	100	100	100
White Shark - Foraging	4,181	100	99	77	6,198	100	100	99
White-faced Storm-petrel - Breeding	4	-	-	-	18	1	-	-
White-faced Storm-petrel - Foraging	5,208	100	100	100	6,281	100	100	100

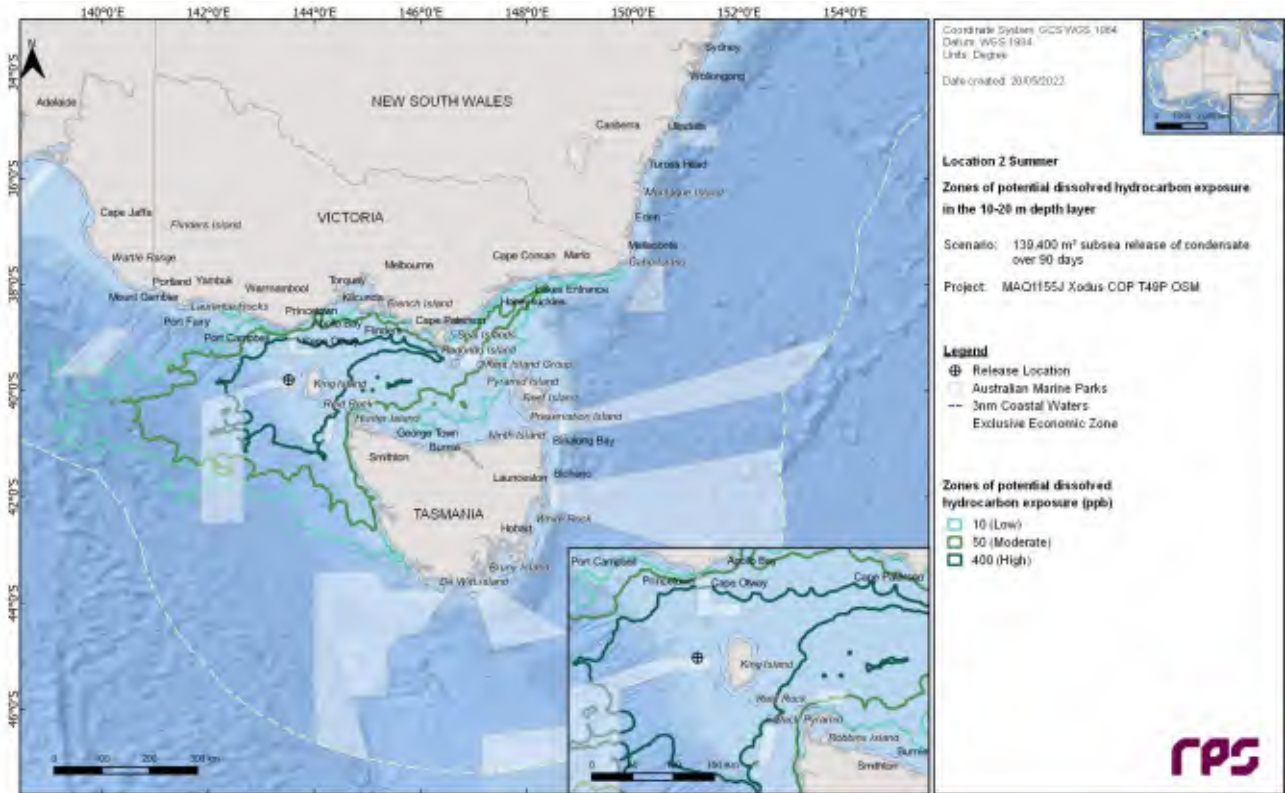


Figure 17.11 Zones of potential dissolved hydrocarbon exposure at 10-20 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

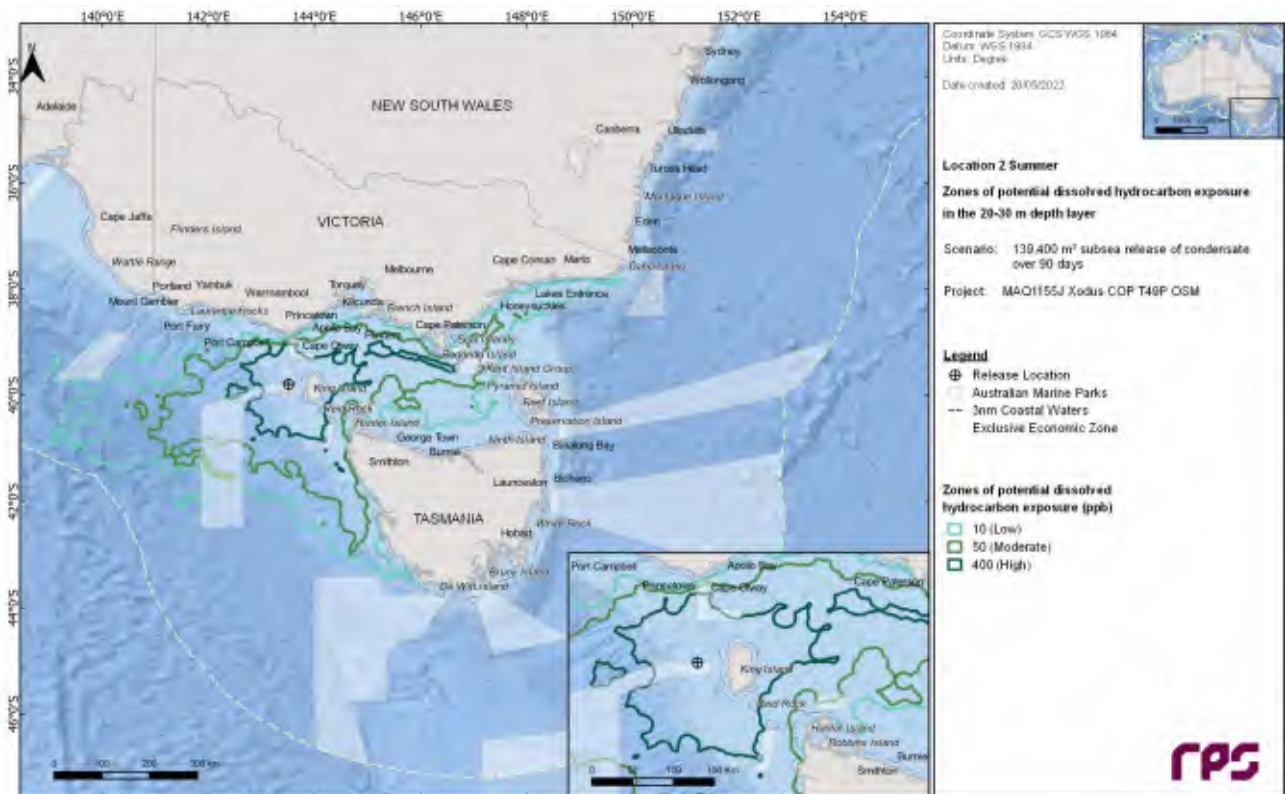


Figure 17.12 Zones of potential dissolved hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

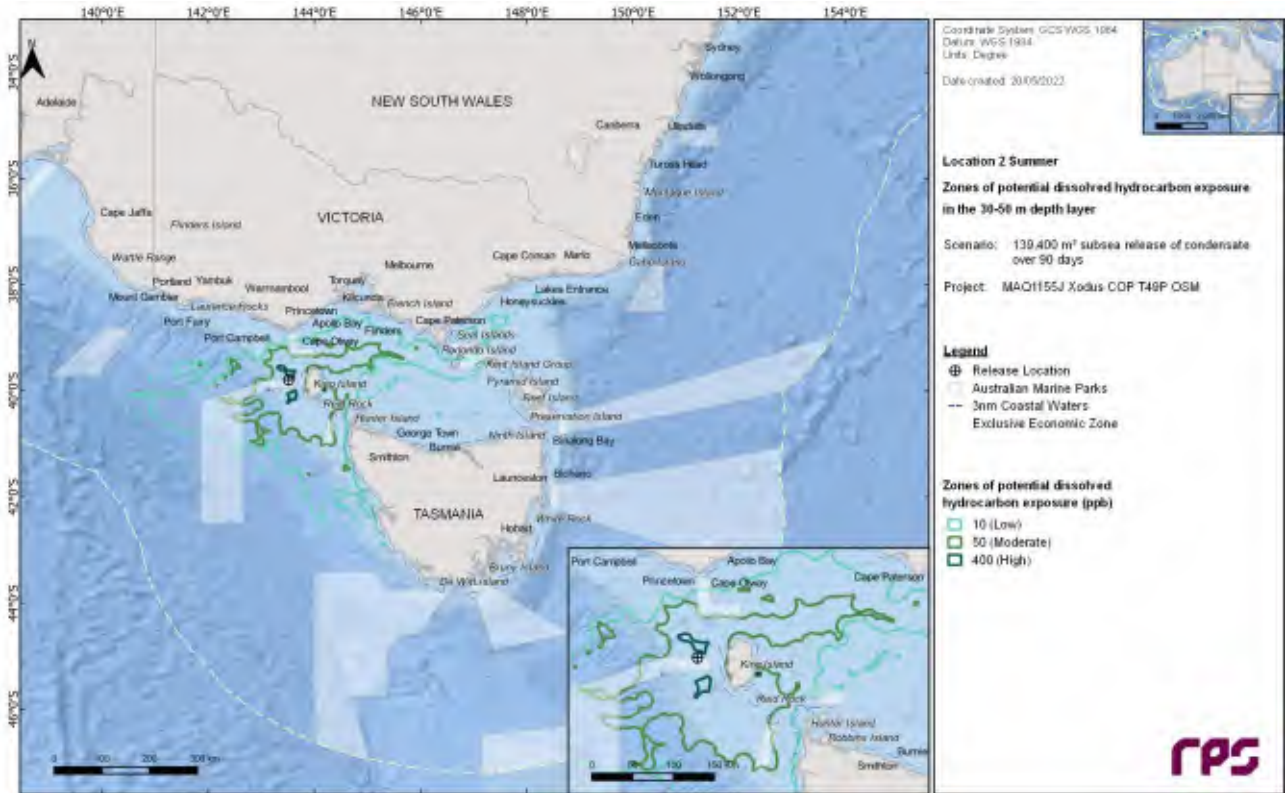


Figure 17.13 Zones of potential dissolved hydrocarbon exposure at 30 - 50 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

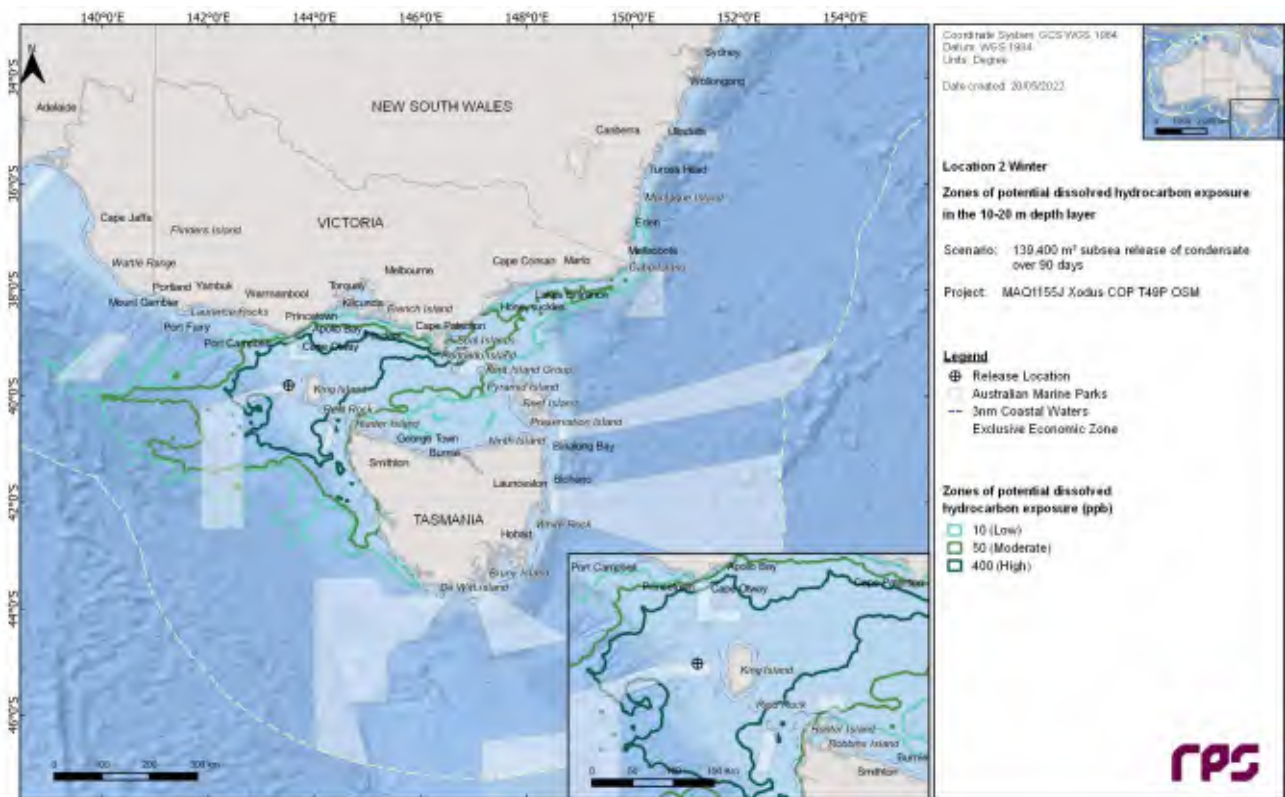


Figure 17.14 Zones of potential dissolved hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

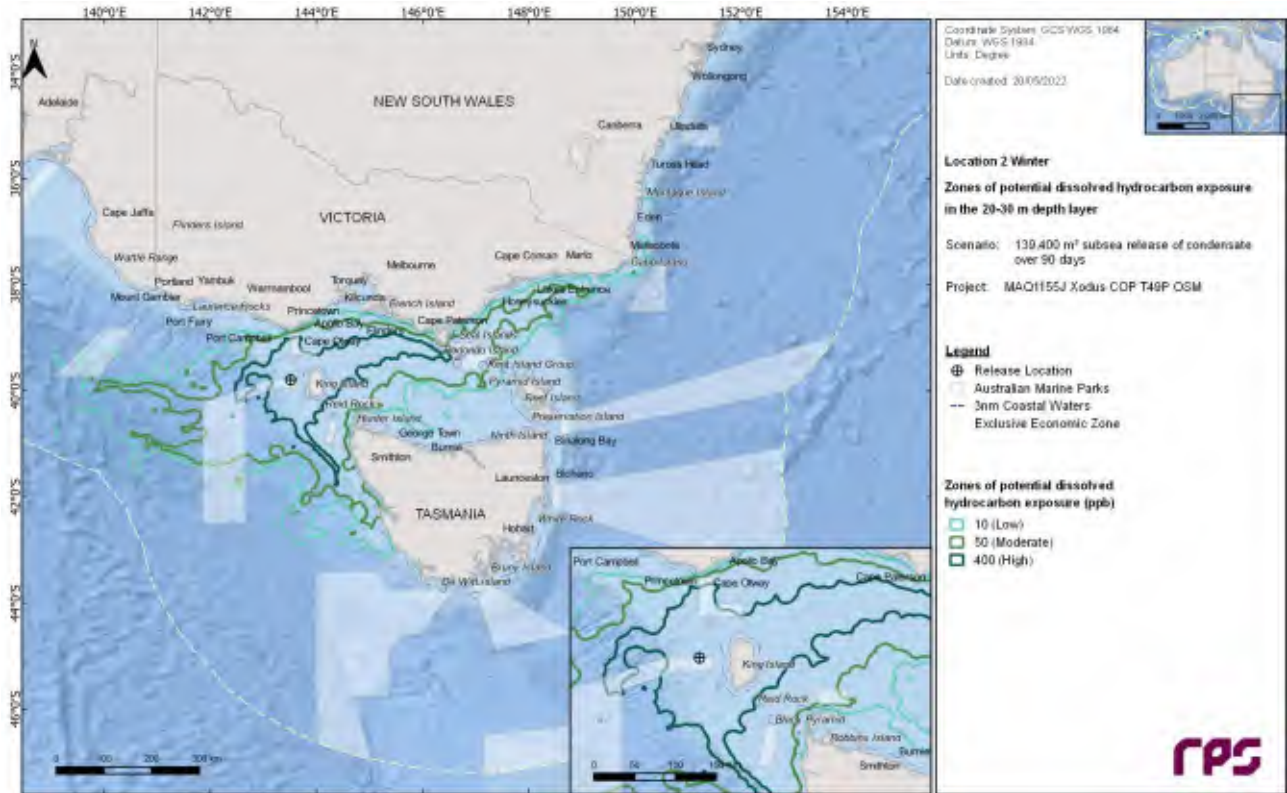


Figure 17.15 Zones of potential dissolved hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

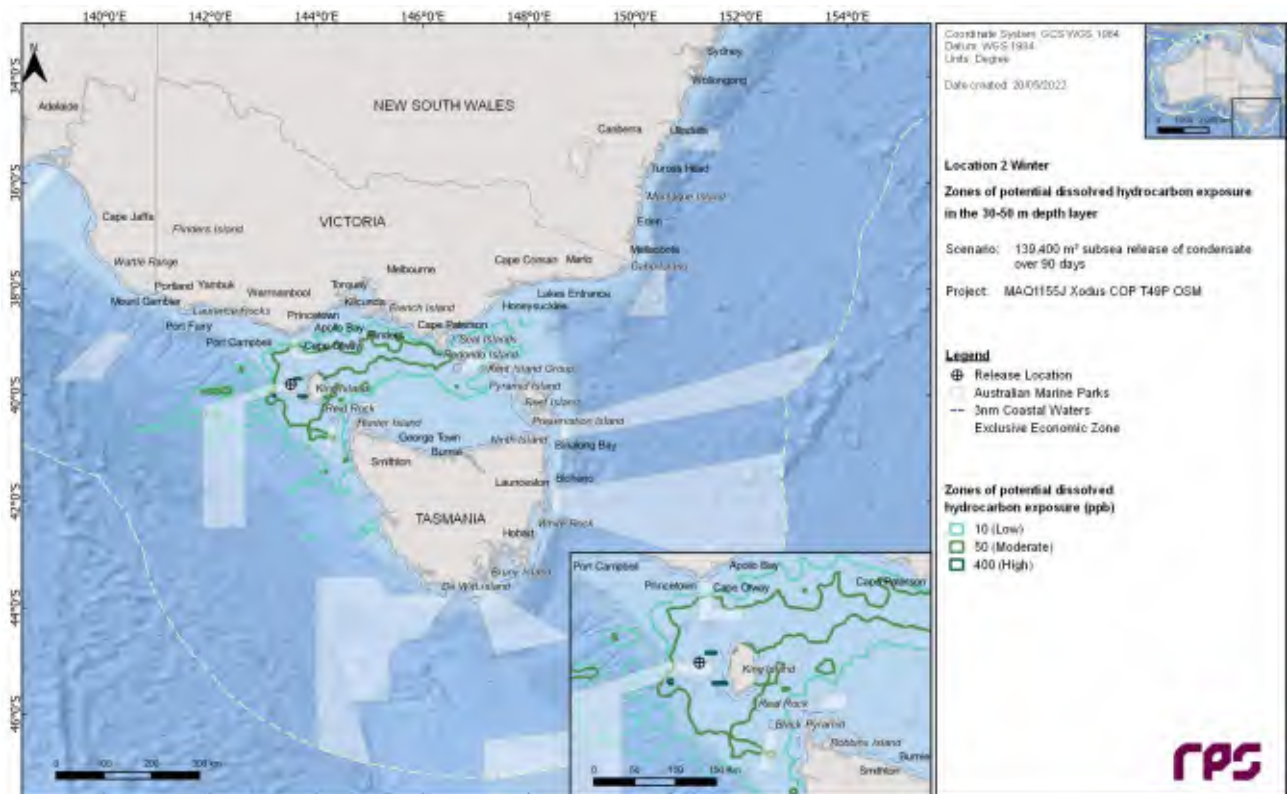


Figure 17.16 Zones of potential dissolved hydrocarbon exposure at 30 - 50 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

17.2.2.2 Entrained Hydrocarbons

Table 17-6 summarises the potential exposure to BIAs from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 17.17 to Figure 17.20 illustrate extent of entrained hydrocarbon exposure for each season in the 10 - 20 m and 20 – 30 m depth layers.

Table 17-6 Probability of entrained hydrocarbons exposure to BIAs in the 0-10 m depth layer from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter		
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
		Low	High		Low	High
Antipodean Albatross - Foraging	12,031	100	100	12,738	100	100
Australasian Gannet - Foraging	874	100	85	1,229	100	98
Black Petrel - Foraging	25	4	-	28	15	-
Black-browed Albatross - Foraging	12,031	100	100	12,738	100	100
Black-faced Cormorant - Foraging	3,844	100	100	2,664	100	100
Bullers Albatross - Foraging	12,031	100	100	12,738	100	100
Campbell Albatross - Foraging	12,031	100	100	12,738	100	100
Common Diving-petrel - Foraging	12,031	100	100	12,738	100	100
Crested Tern - Breeding	14	3	-	21	17	-
Crested Tern - Foraging	20	3	-	28	16	-
Flesh-footed Shearwater - Foraging	25	4	-	28	15	-
Great-winged Petrel - Foraging	24	4	-	28	12	-
Grey Nurse Shark - Foraging	33	15	-	29	29	-
Grey Nurse Shark - Migration	40	14	-	38	31	-
Humpback Whale - Foraging	40	15	-	39	34	-
BIA Indian Yellow-nosed Albatross - Foraging	12,031	100	100	12,738	100	100
Indo-Pacific/Spotted Bottlenose Dolphin - Breeding	29	16	-	30	26	-
Little Penguin - Breeding	182	49	5	142	85	2
Little Penguin - Foraging	3,318	100	100	2,623	100	100
Northern Giant Petrel - Foraging	24	4	-	28	12	-
Pygmy Blue Whale - Distribution	12,031	100	100	12,738	100	100
Pygmy Blue Whale - Foraging	12,031	100	100	12,738	100	100
Short-tailed Shearwater - Breeding	747	100	90	802	100	100
Short-tailed Shearwater - Foraging	12,031	100	100	12,738	100	100
Shy Albatross - Foraging	12,031	100	100	12,738	100	100
Soft-plumaged Petrel - Foraging	156	74	8	167	40	11
Sooty Shearwater - Foraging	40	29	-	110	27	1
Southern Giant Petrel - Foraging	24	4	-	28	12	0
Southern Right Whale - Aggregation	83	8	-	94	4	0

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Southern Right Whale - Connecting Habitat	2,694	100	100	2,939	100	100
Southern Right Whale - Migration	12,031	100	100	12,738	100	100
Wandering Albatross - Foraging	12,031	100	100	12,738	100	100
Wedge-tailed Shearwater - Foraging	12,031	100	100	12,738	100	100
White Shark - Breeding	54	19	-	90	48	-
White Shark - Distribution	12,031	100	100	12,738	100	100
White Shark - Foraging	2,694	100	100	2,270	100	100
White-capped Albatross - Foraging	24	4	-	28	12	-
White-faced Storm-petrel - Breeding	30	13	-	32	22	-
White-faced Storm-petrel - Foraging	2,694	100	100	2,939	100	100
White-fronted Tern - Foraging	30	5	-	25	2	-
Wilson's Storm Petrel - Migration	24	4	-	28	12	-

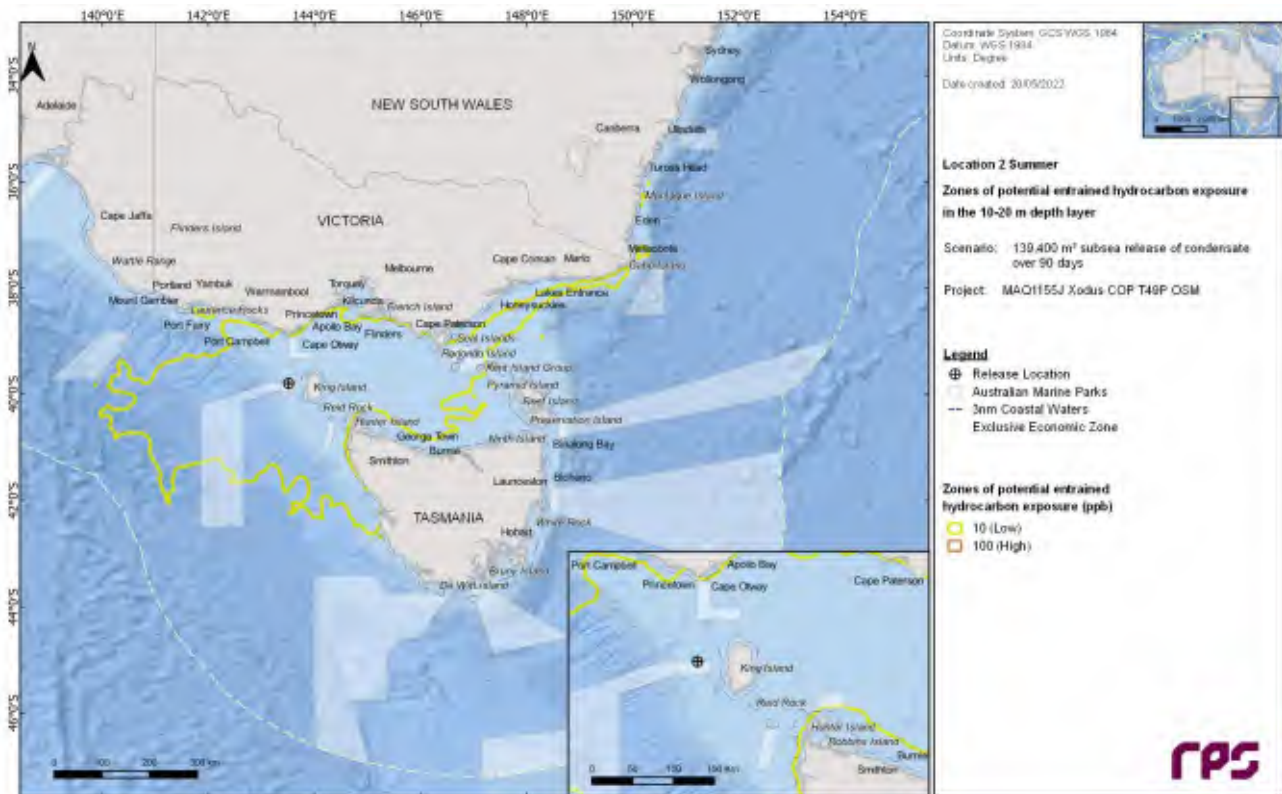


Figure 17.17 Zones of potential entrained hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

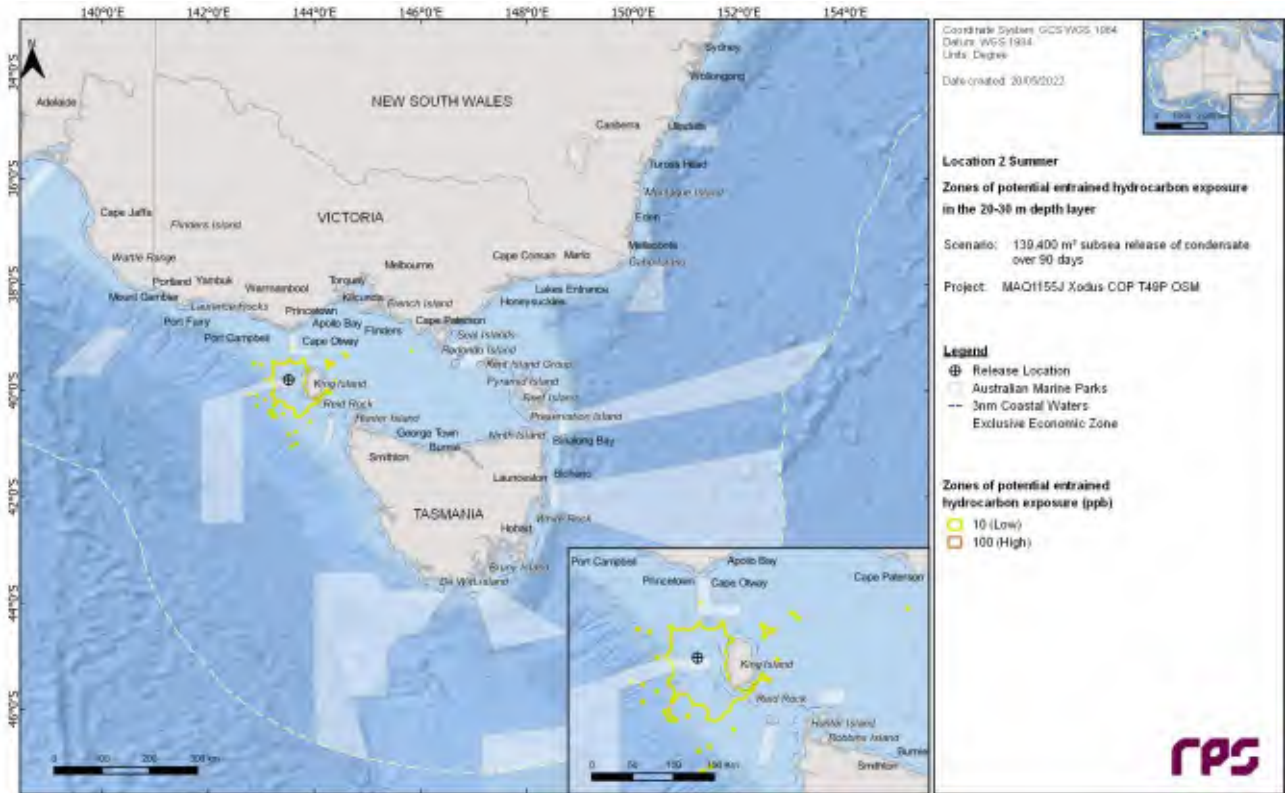


Figure 17.18 Zones of potential entrained hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

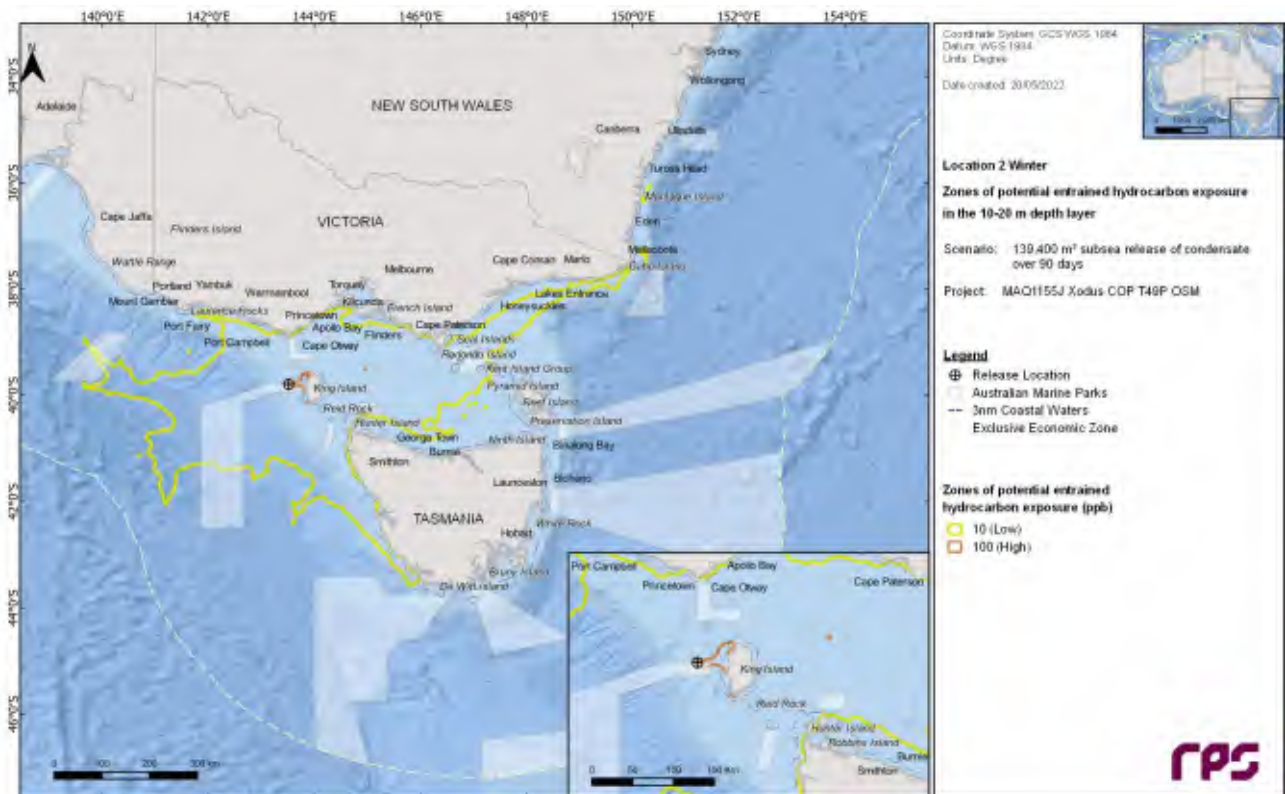


Figure 17.19 Zones of potential entrained hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

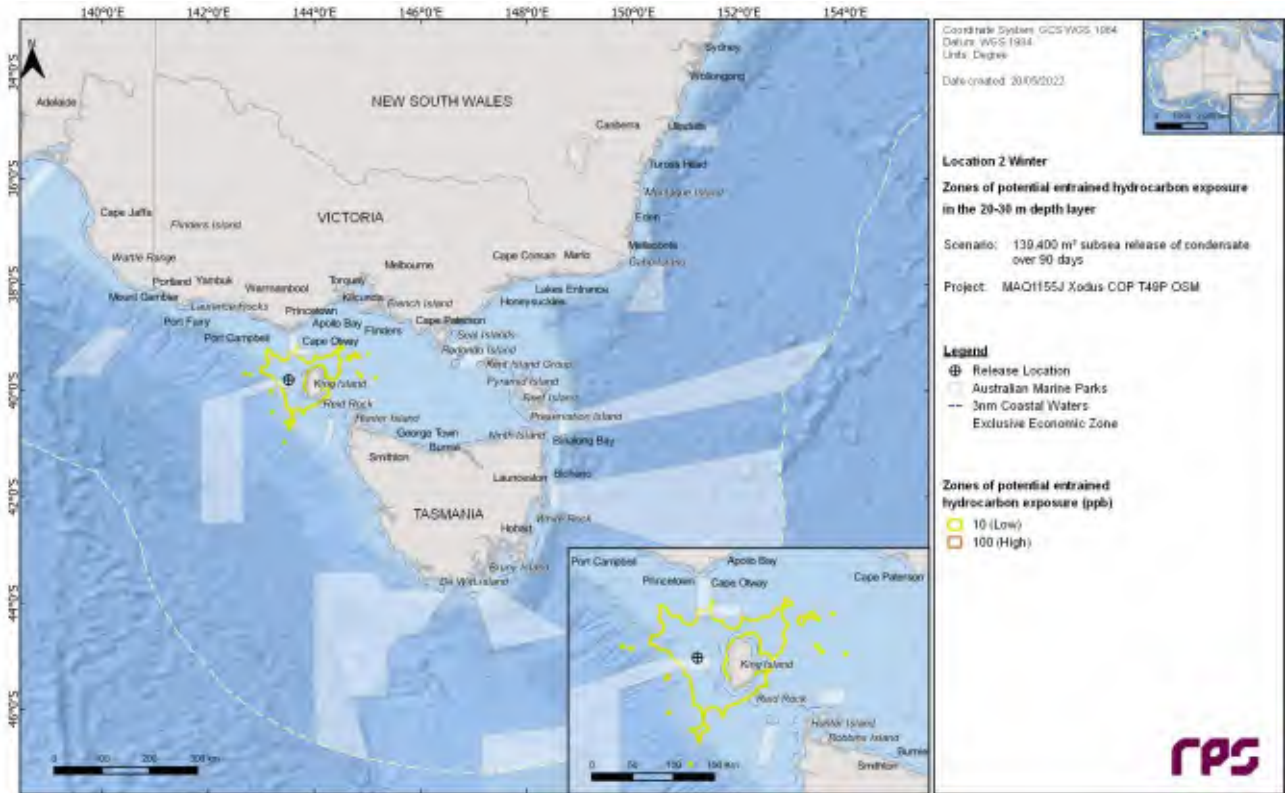


Figure 17.20 Zones of potential entrained hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

17.3 Location 3

17.3.1 Floating Oil Exposure

Table 17-7 summarises the potential floating oil exposure to BIAs for each season.

Table 17-7 Summary of the potential exposure by floating oil to BIAs from a subsea LOWC at Location 3 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter					
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Antipodean Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Australasian Gannet - Foraging	74	-	-	2.29	-	-	98	-	-	1.63	-	-
Black-browed Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Black-faced Cormorant - Foraging	23	-	-	6.63	-	-	33	-	-	5.17	-	-
Bullers Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Campbell Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Common Diving-petrel - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Indian Yellow-nosed Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Little Penguin - Foraging	21	-	-	18.25	-	-	57	-	-	2.04	-	-
Pygmy Blue Whale - Distribution	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Pygmy Blue Whale - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Short-tailed Shearwater - Breeding	-	-	-	-	-	-	-	-	-	-	-	-
Short-tailed Shearwater - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Shy Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Soft-plumaged Petrel - Foraging	-	-	-	-	-	-	-	-	-	-	-	-
Sooty Shearwater - Foraging	-	-	-	-	-	-	-	-	-	-	-	-
Southern Right Whale - Connecting Habitat	72	-	-	2.13	-	-	97	-	-	1.58	-	-

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Southern Right Whale - Migration	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Wandering Albatross - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
Wedge-tailed Shearwater - Foraging	77	-	-	0.96	-	-	77	-	-	0.92	-	-
White Shark - Distribution	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67
White Shark - Foraging	99	-	-	1.29	-	-	100	-	-	1.17	-	-
White-faced Storm-petrel - Foraging	100	100	14	0.04	0.04	2.25	100	100	9	0.04	0.04	13.67

17.3.2 In-water exposure

17.3.2.1 Dissolved Hydrocarbons

Table 17-8 summarises the potential exposure to BIAs from dissolved hydrocarbons in the 0 – 10 m depth layer for each threshold and season.

Figure 17.21 to Figure 17.26 illustrate the extent of dissolved hydrocarbon exposure in the 10-20 m, 20 – 30 m and 30 – 50 m depth layers for each season.

Table 17-8 Probability of dissolved hydrocarbons exposure to BIAs in the 0-10 m depth layer from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter				
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
		Low	Mod erate	High		Low	Mode rate	High
Antipodean Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Australasian Gannet - Foraging	3,228	100	100	46	3,446	100	100	66
Black Petrel - Foraging	1	-	-	-	40	1	-	-
Black-browed Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Black-faced Cormorant - Foraging	1,423	95	69	8	1,355	100	96	13
Bullers Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Campbell Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Common Diving-petrel - Foraging	6,534	100	100	100	8,039	100	100	100
BIA Crested Tern - Breeding	2	-	-	-	19	1	-	-
Crested Tern - Foraging	1	-	-	-	40	2	-	-
Flesh-footed Shearwater - Foraging	1	-	-	-	40	1	-	-
Grey Nurse Shark - Foraging	6	-	-	-	27	2	-	-
Grey Nurse Shark - Migration	6	-	-	-	41	2	-	-
Humpback Whale - Foraging	9	-	-	-	41	2	-	-
Indian Yellow-nosed Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Indo-Pacific/Spotted Bottlenose Dolphin - Breeding	12	1	-	-	23	2	-	-
Little Penguin - Breeding	131	11	2	0	109	27	6	0

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Little Penguin - Foraging	1,237	99	82	8	1,961	100	99	22
Pygmy Blue Whale - Distribution	5,914	100	100	100	8,039	100	100	100
Pygmy Blue Whale - Foraging	6,534	100	100	100	8,039	100	100	100
Short-tailed Shearwater - Breeding	234	31	6	-	196	45	13	-
Short-tailed Shearwater - Foraging	6,534	100	100	100	8,039	100	100	100
Shy Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Soft-plumaged Petrel - Foraging	863	74	29	2	561	50	20	1
Sooty Shearwater - Foraging	157	10	2	-	162	11	2	0
Southern Right Whale - Breeding	14	1	-	-	-	-	-	-
Southern Right Whale - Connecting Habitat	2,466	100	99	38	2,833	100	100	58
Southern Right Whale - Migration	5,914	100	100	100	8,039	100	100	100
Wandering Albatross - Foraging	6,534	100	100	100	8,039	100	100	100
Wedge-tailed Shearwater - Foraging	3,764	84	83	48	3,213	93	69	45
White Shark - Breeding	53	4	1	-	72	6	1	-
White Shark - Distribution	6,534	100	100	100	8,039	100	100	100
White Shark - Foraging	3,102	100	100	78	4,030	100	100	90
White-faced Storm-petrel - Breeding	6	-	-	-	41	2	-	-
White-faced Storm-petrel - Foraging	5,914	100	100	100	8,039	100	100	100

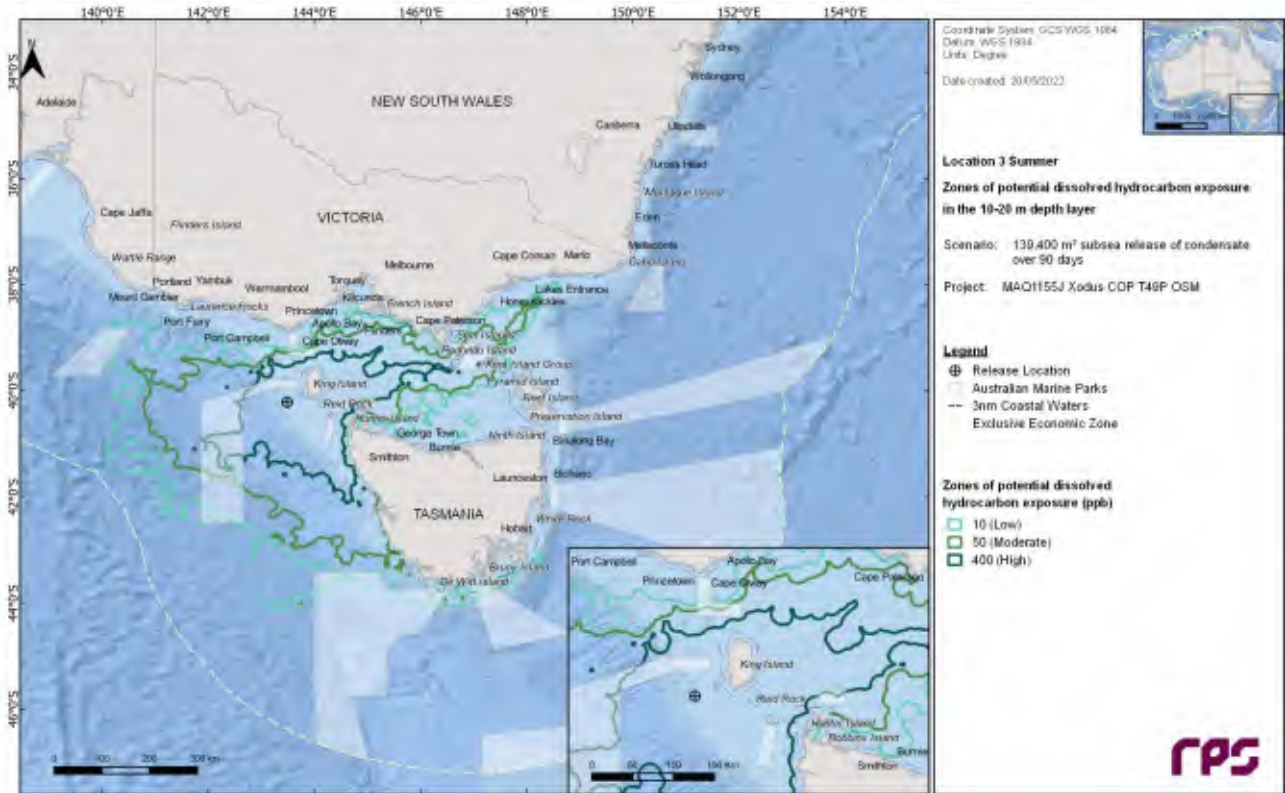


Figure 17.21 Zones of potential dissolved hydrocarbon exposure at 10-20 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

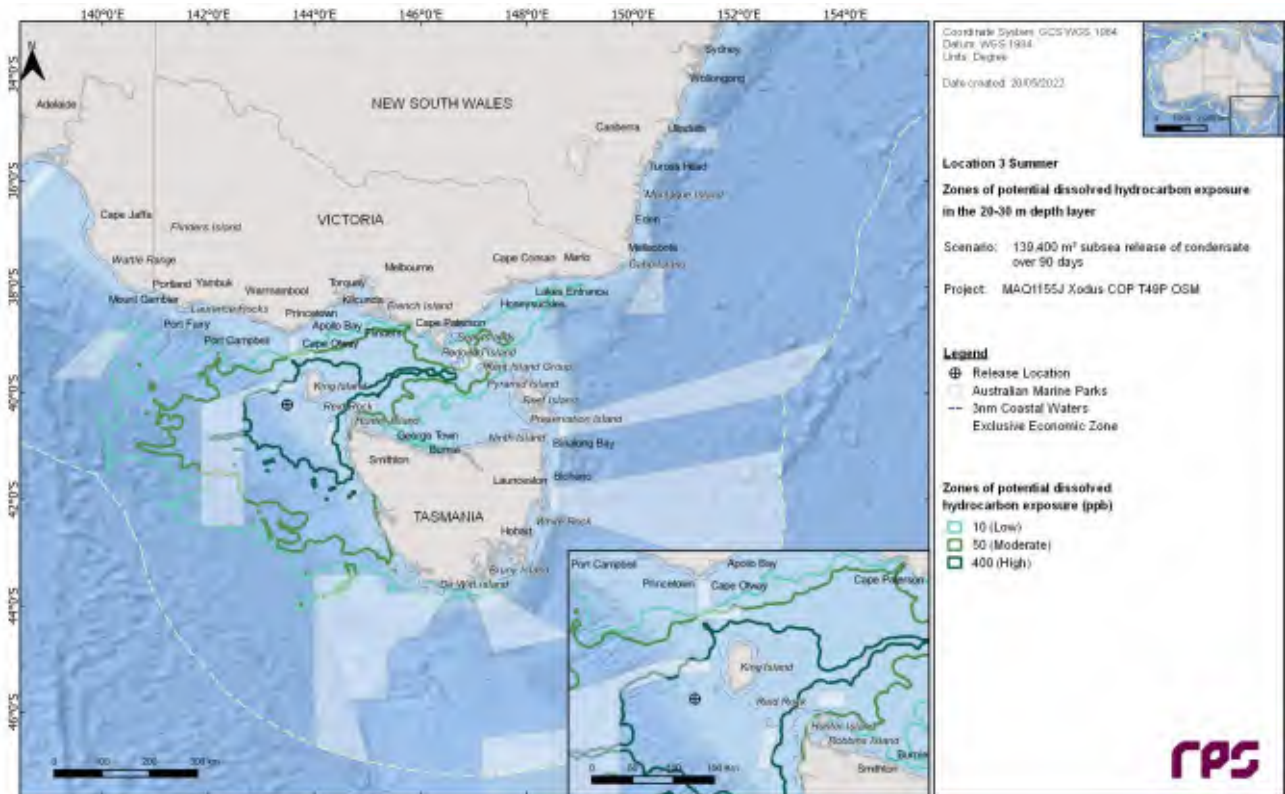


Figure 17.22 Zones of potential dissolved hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

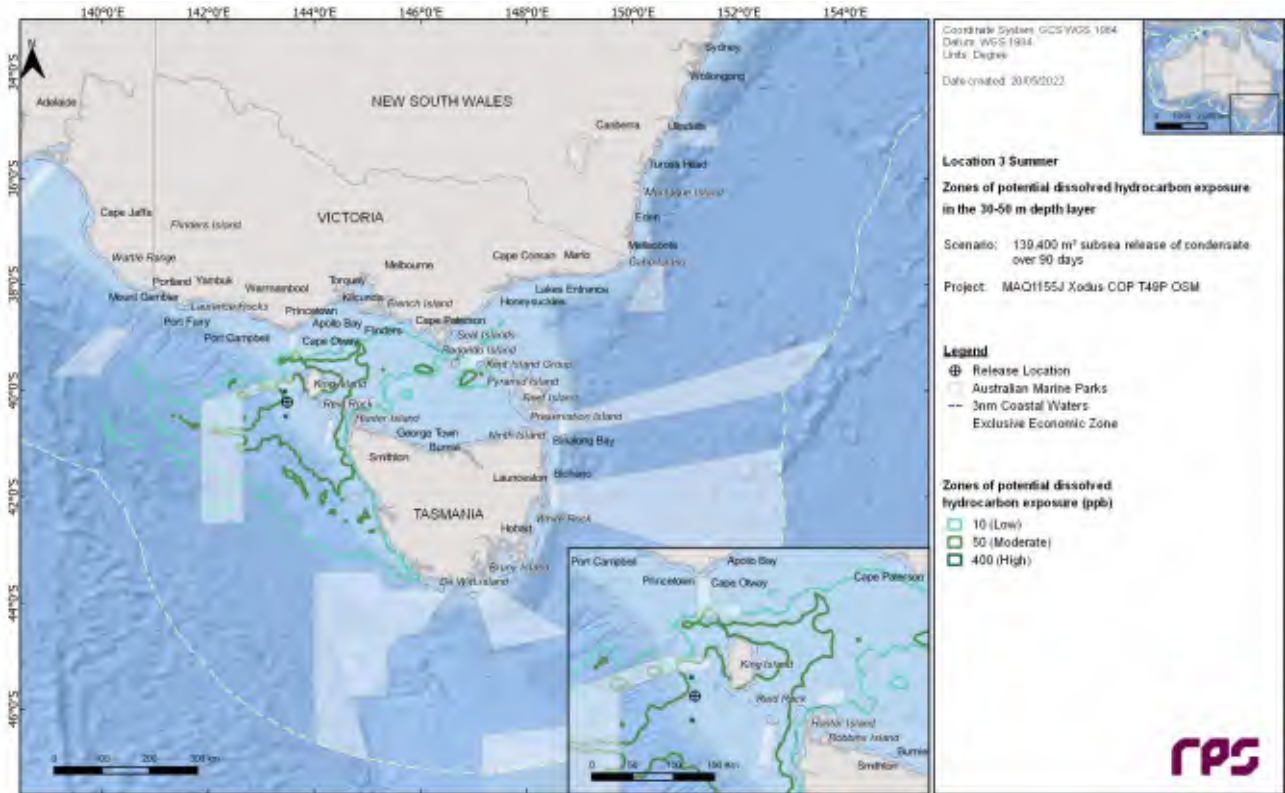


Figure 17.23 Zones of potential dissolved hydrocarbon exposure at 30 - 50 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

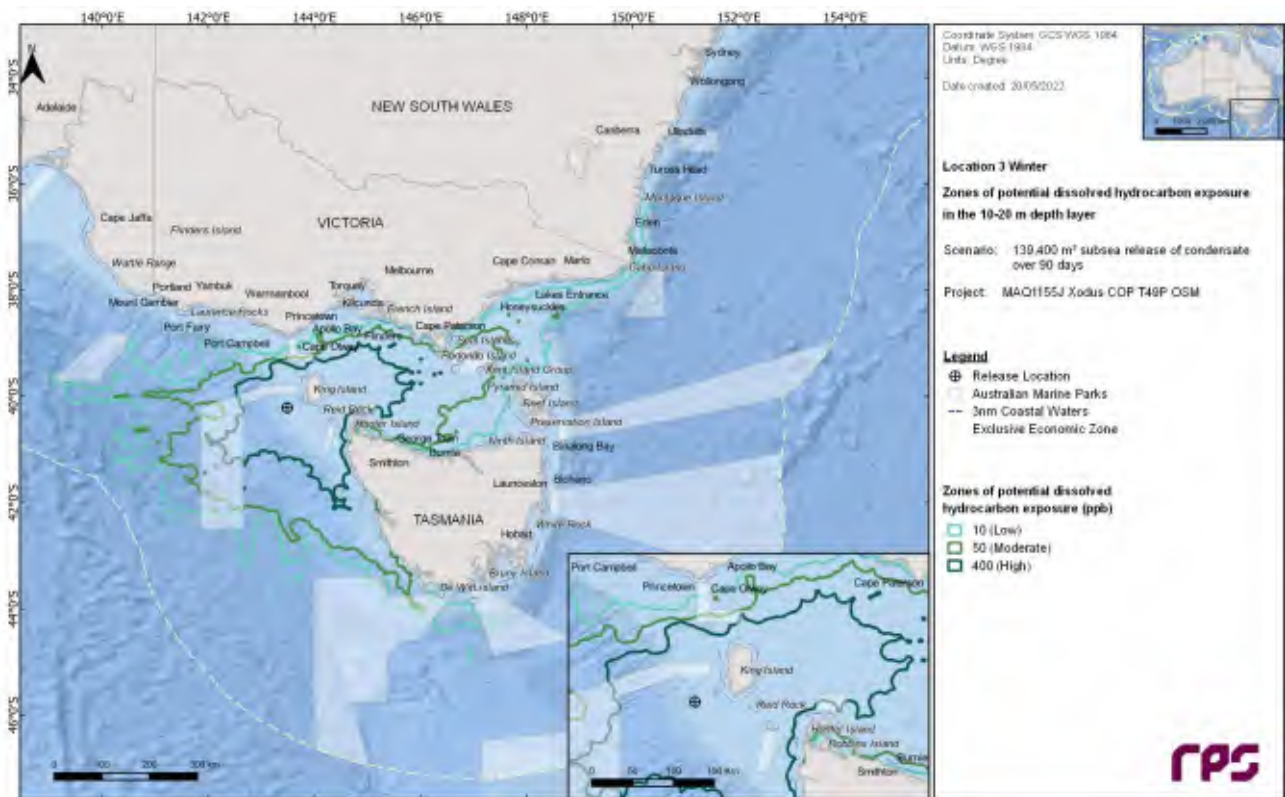


Figure 17.24 Zones of potential dissolved hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

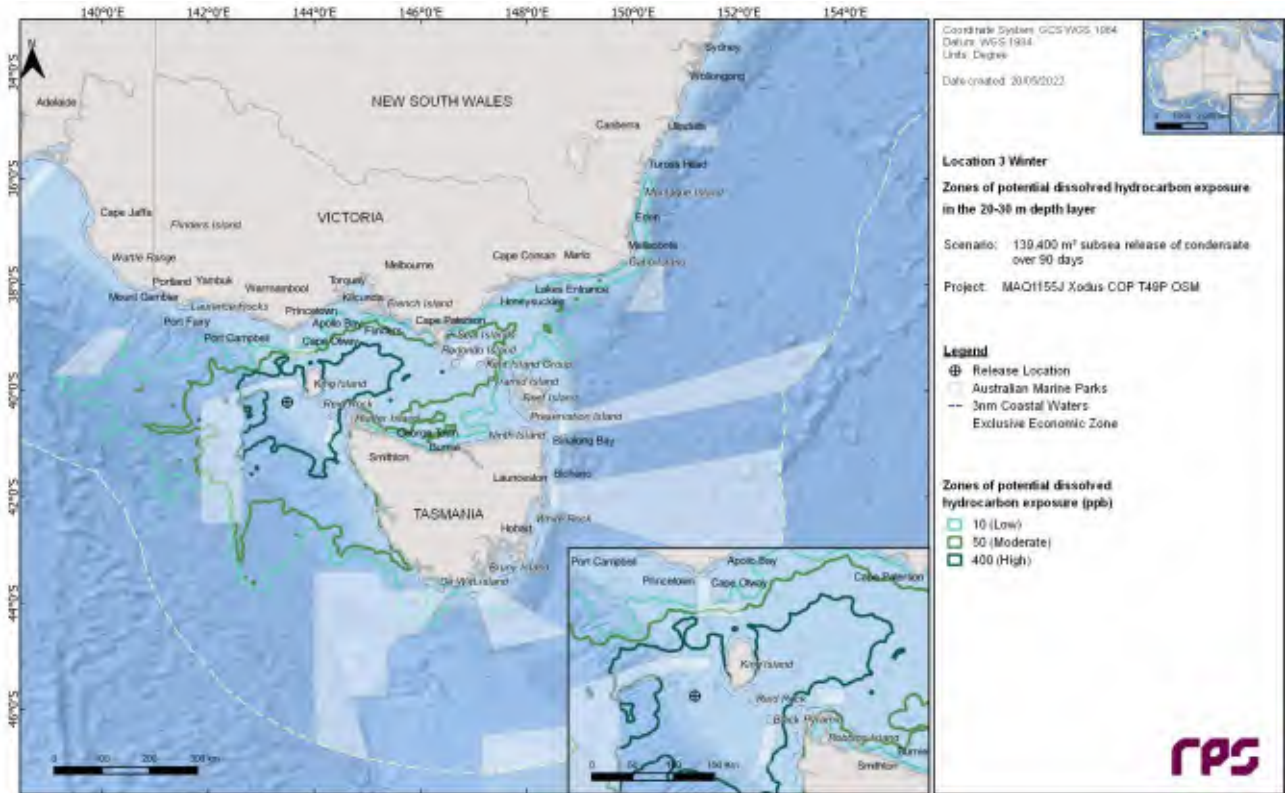


Figure 17.25 Zones of potential dissolved hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

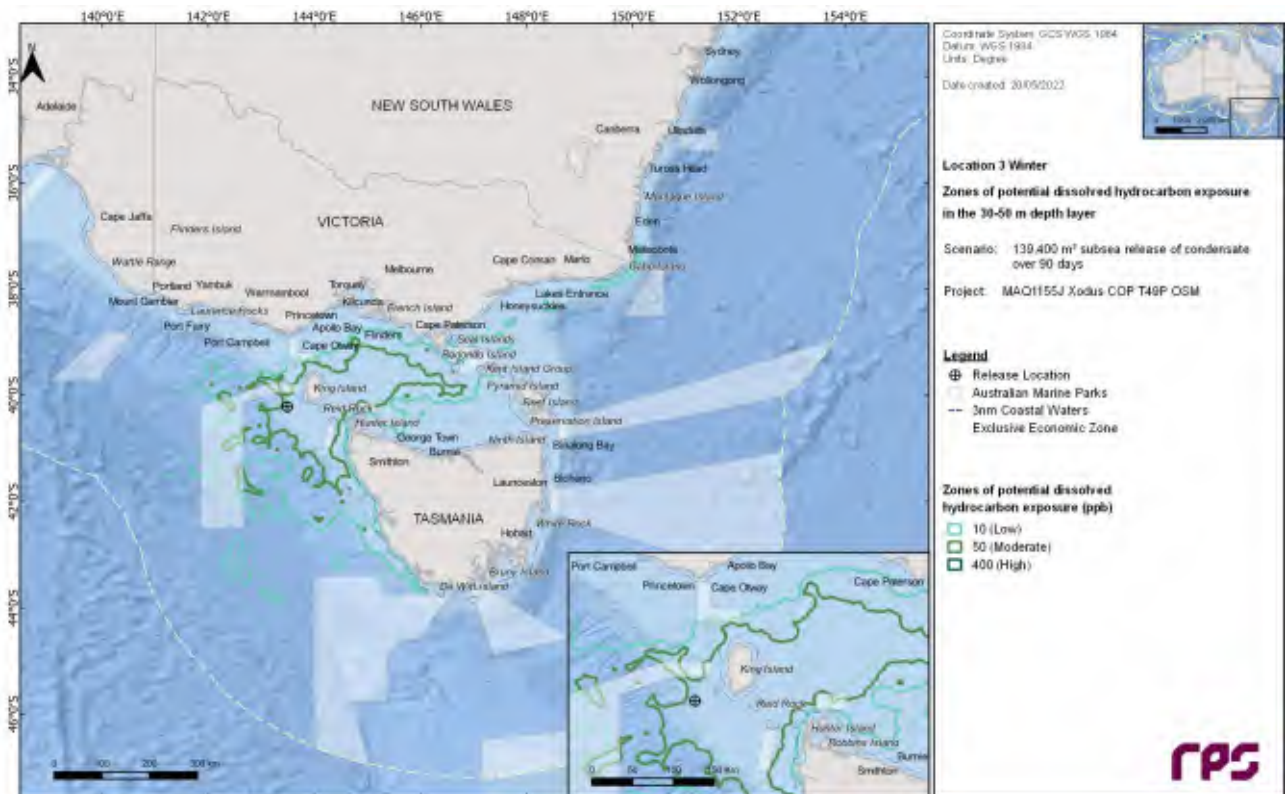


Figure 17.26 Zones of potential dissolved hydrocarbon exposure at 30 - 50 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

17.3.2.2 Entrained Hydrocarbons

Table 17-9 summarises the potential exposure to BIAs from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 17.27 to Figure 17.30 illustrate extent of entrained hydrocarbon exposure for each season in the 10 - 20 m and 20 – 30 m depth layers.

Table 17-9 Probability of entrained hydrocarbons exposure to BIAs in the 0-10 m depth layer from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter		
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
		Low	High		Low	High
Antipodean Albatross - Foraging	13,383	100	100	11,498	100	100
Australasian Gannet - Foraging	1,109	100	100	1,158	100	100
Black Petrel - Foraging	14	1	-	21	8	-
Black-browed Albatross - Foraging	13,383	100	100	11,498	100	100
Black-faced Cormorant - Foraging	733	100	66	613	100	70
Bullers Albatross - Foraging	13,383	100	100	11,498	100	100
Campbell Albatross - Foraging	13,383	100	100	11,498	100	100
Common Diving-petrel - Foraging	13,383	100	100	11,498	100	100
Crested Tern - Breeding	12	1	-	19	7	-
Crested Tern - Foraging	14	1	-	21	8	-
Flesh-footed Shearwater - Foraging	14	1	-	21	8	-
Great-winged Petrel - Foraging	11	1	-	16	3	-
Grey Nurse Shark - Foraging	18	4	-	35	23	-
Grey Nurse Shark - Migration	29	6	-	37	25	-
Humpback Whale - Foraging	29	8	-	37	28	-
BIA Indian Yellow-nosed Albatross - Foraging	13,383	100	100	11,498	100	100
Indo-Pacific/Spotted Bottlenose Dolphin - Breeding	12	1	-	23	19	-
Little Penguin - Breeding	131	78	4	125	85	5
Little Penguin - Foraging	733	100	94	679	100	100
Northern Giant Petrel - Foraging	11	1	-	16	3	-
Pygmy Blue Whale - Distribution	13,383	100	100	11,498	100	100
Pygmy Blue Whale - Foraging	13,383	100	100	11,498	100	100
Short-tailed Shearwater - Breeding	199	90	22	353	92	34
Short-tailed Shearwater - Foraging	13,383	100	100	11,498	100	100
Shy Albatross - Breeding	20	8	-	12	2	-
Shy Albatross - Foraging	13,383	100	100	11,498	100	100
Soft-plumaged Petrel - Foraging	408	99	33	412	79	18
Sooty Shearwater - Foraging	94	55	-	120	49	7
Southern Giant Petrel - Foraging	11	1	-	16	3	-

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Southern Right Whale - Aggregation	26	3	-	29	2	-
Southern Right Whale - Breeding	6	-	-	11	1	-
Southern Right Whale - Connecting Habitat	1,313	100	100	1,650	100	100
Southern Right Whale - Migration	13,383	100	100	11,498	100	100
Wandering Albatross - Foraging	13,383	100	100	11,498	100	100
Wedge-tailed Shearwater - Foraging	1,469	94	85	2,042	99	73
White Shark - Breeding	46	23	0	58	38	0
White Shark - Distribution	13,383	100	100	11,498	100	100
White Shark - Foraging	1,530	100	100	1,590	100	100
White-capped Albatross - Foraging	11	1	-	16	3	-
White-faced Storm-petrel - Breeding	21	4	-	26	17	-
White-faced Storm-petrel - Foraging	13,383	100	100	11,244	100	100
White-fronted Tern - Foraging	27	2	-	33	25	-
Wilson's Storm Petrel - Migration	11	1	-	16	3	-

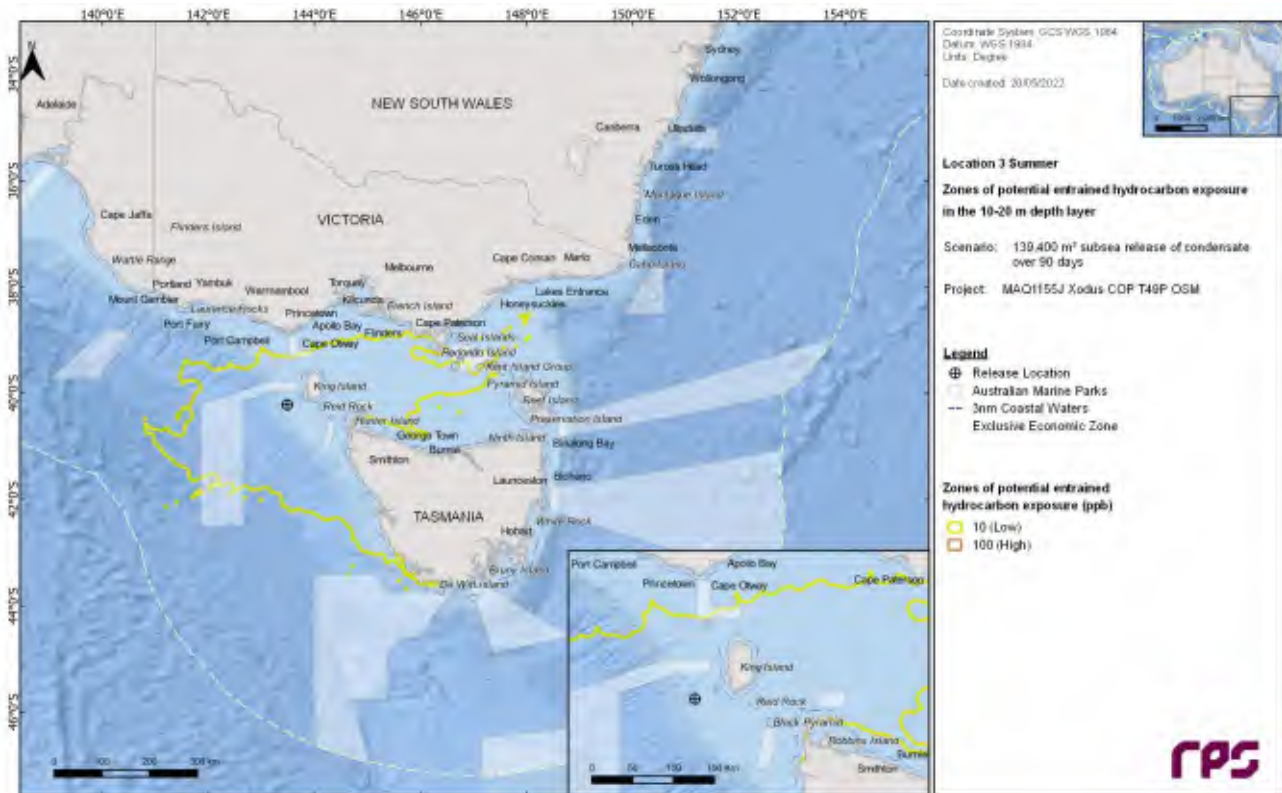


Figure 17.27 Zones of potential entrained hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

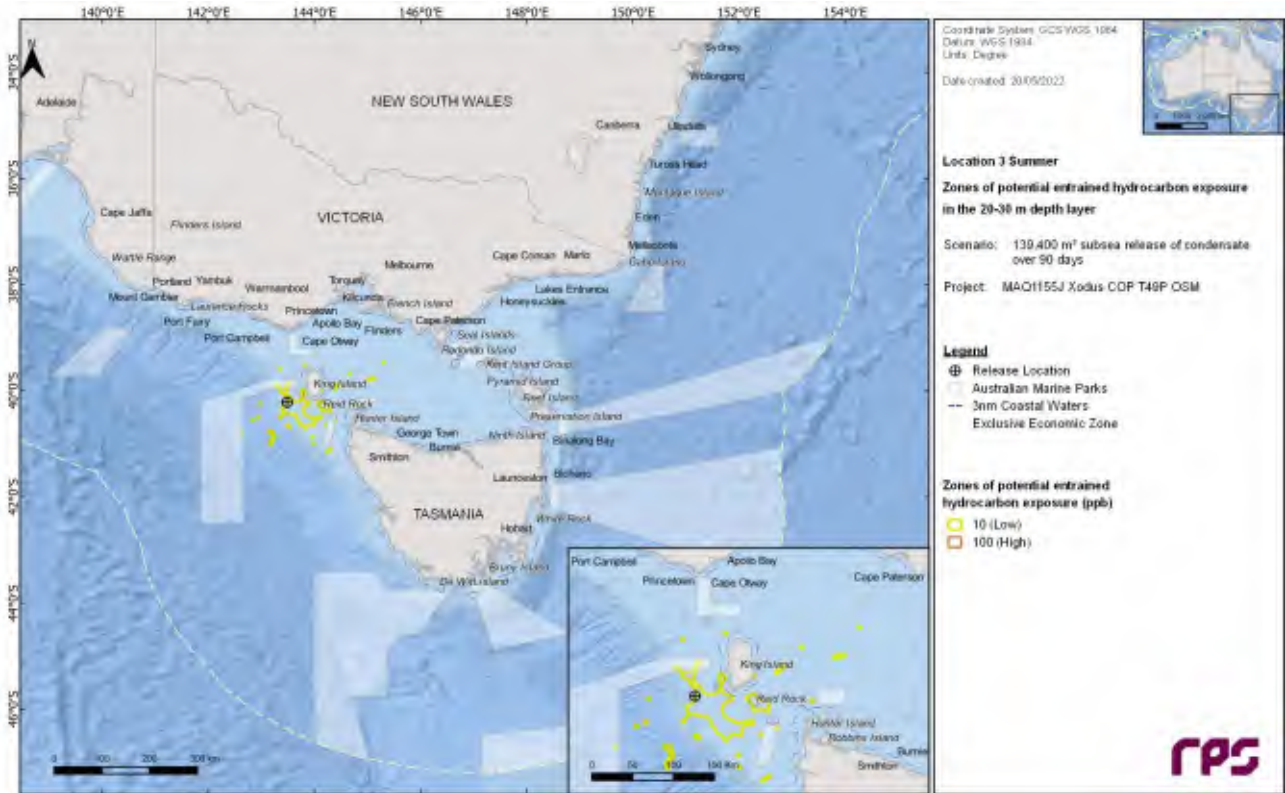


Figure 17.28 Zones of potential entrained hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

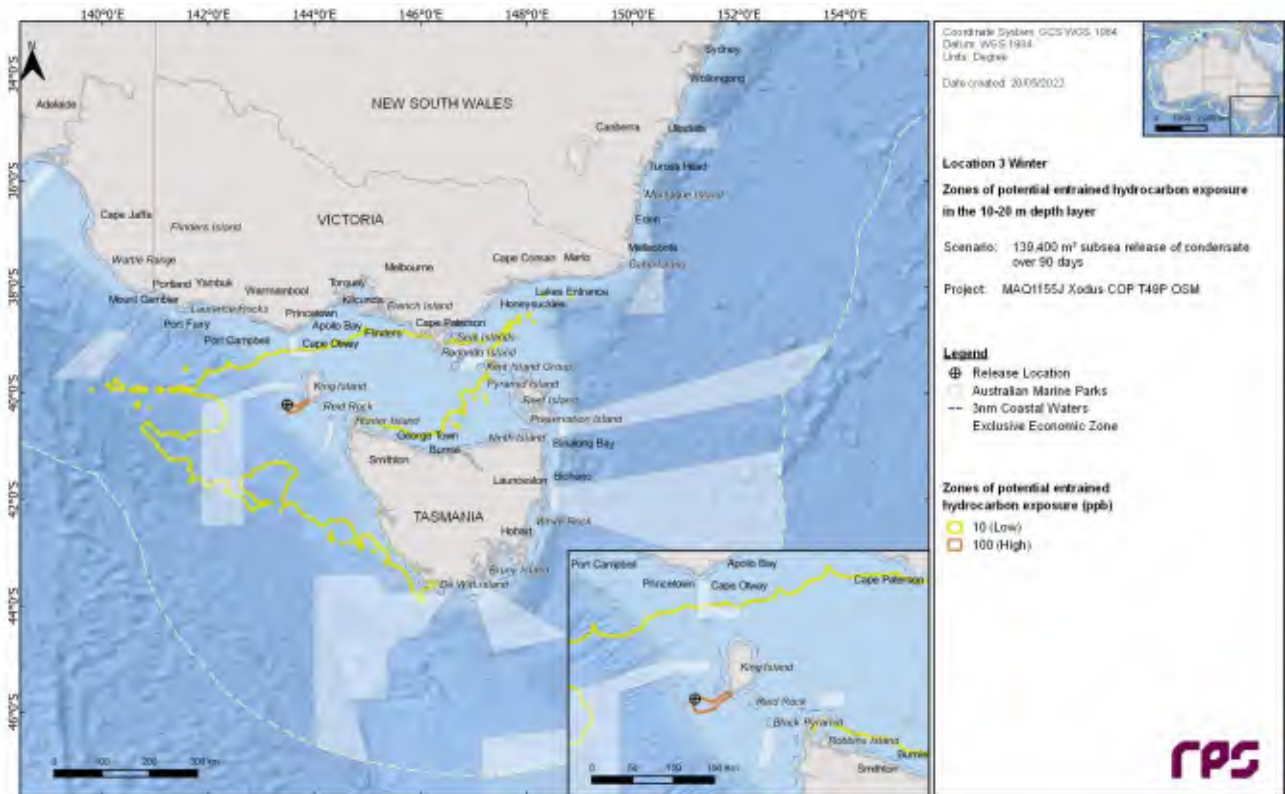


Figure 17.29 Zones of potential entrained hydrocarbon exposure at 10 - 20 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

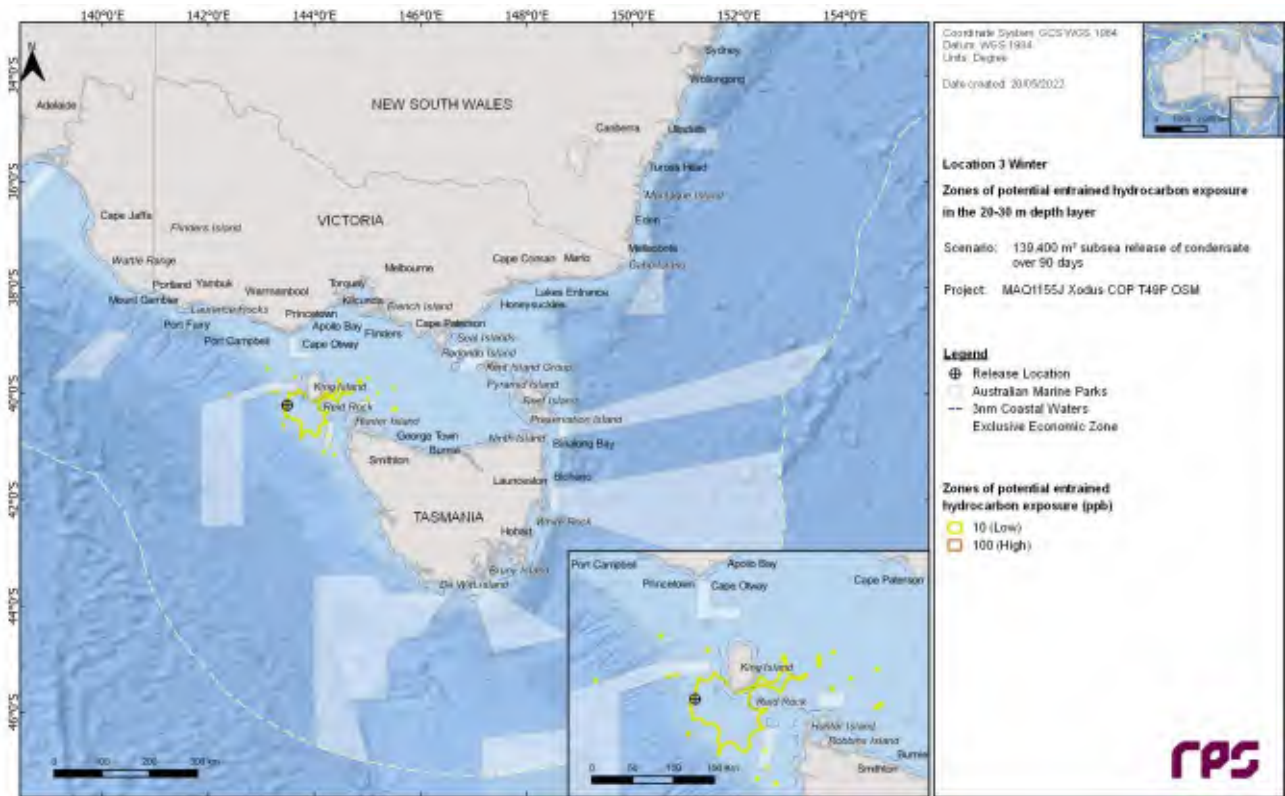


Figure 17.30 Zones of potential entrained hydrocarbon exposure at 20 - 30 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

CONOCOPHILLIPS EXPLORATION PERMIT VIC/P79 OIL SPILL MODELLING

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TERMS AND ABBREVIATIONS

Actionable oil	Oil which is thick enough for the effective use of mitigation strategies
AMSA	Australian Maritime Safety Authority
API	American Petroleum Institute gravity. A measure of how heavy or light a petroleum liquid is compared to water.
Bonn Agreement	An agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, 1983, includes: Governments of the Kingdom of Belgium, the Kingdom of Denmark, the French Republic, the Federal Republic of Germany, the Republic of Ireland, the Kingdom of the Netherlands, the Kingdom of Norway, the Kingdom of Sweden, the United Kingdom of Great Britain and Northern Ireland and the European Union.
BP	Boiling point. The temperature at which the vapor pressure of the liquid is equal to the pressure exerted on it by the surrounding atmosphere
BTEX	Benzene, toluene, ethylbenzene, and xylenes
Decay	The process where oil components are changed either chemically or biologically (biodegradation) to another compound. It includes breakdown to simpler organic carbon compounds by bacteria and other organisms, photo-oxidation by solar energy, and other chemical reactions.
Deterministic (single) spill modelling	Oil spill modelling involving a computer simulation of a single hypothetical oil spill event subject to a single sequence of wind, current and other sea conditions over time. Single oil spill modelling, also referred to as “deterministic modelling” provides a simulation of one possible outcome of a given spill scenario, subject to the metocean conditions that are imposed. Single oil spill modelling is commonly used to consider the fate and effects of ‘worst-case’ oil spill scenarios that are carefully selected in consideration of the nature and scale of the offshore petroleum activity and the local environment (NOPSEMA, 2017). Because the outcomes of a single oil spill simulation can only represent the outcome of that scenario under one sequence of metocean conditions, worst-case conditions are often identified from stochastic modelling. It is impossible to calculate the likelihood of any outcome from a single oil spill simulation. Single oil spill modelling is generally used for response planning, preparedness planning and for supporting oil spill response operations in the event of an actual spill
Dynamic viscosity	The dynamic viscosity of a fluid expresses its resistance to shearing flows, where adjacent layers move parallel to each other with different speeds.
Floating oil exposure	Contact by floating oil on the sea surface at concentrations equal to or exceeding defined threshold concentrations. The consequence will vary depending on the threshold and the receptors
GODAE	Global Ocean Data Assimilation Experiment
HYCOM	Hybrid Coordinate Ocean Model. A data-assimilative, three-dimensional ocean model
HYDROMAP	Advanced ocean/coastal tidal model used to predict tidal water levels, current speed and current direction.
ITOPF	International Tanker Owners Pollution Federation Limited
MAHs	Monoaromatic hydrocarbons
MMA	Marine Management Area
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
PAH	Polynuclear aromatic hydrocarbons
Pour point	The pour point of a liquid is the temperature below which the liquid loses its flow characteristics
Ramsar site	A site listed under the Ramsar Convention on wetlands which is an international intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.

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Shoreline accumulation	Arrival of oil at or near shorelines at on-water concentrations equal to or exceeding defined threshold concentrations. Shoreline contact is judged for floating oil arriving within a 2 km buffer zone from any shoreline as a conservative measure
SIMAP	Spill Impact Model Application Package. SIMAP is designed to simulate the fate and effects of spilled hydrocarbons for surface or subsea releases
Stochastic (multiple) spill modelling	Stochastic oil spill modelling is created by overlaying and statistically analysing the outcomes of many single oil-spill simulations of a defined spill scenario, where each simulation was subject to a different sequence of metocean conditions, selected objectively (typically by random selection) from a long sequence of historic conditions for the study area. Analysis of this larger set of simulations provides a more accurate indication of the environment that maybe affected (EMBA) and indicates which locations are more likely to be affected (as well as other statistics). Stochastic oil spill modelling avoids biases that affect single oil spill modelling (due to the reliance on only one possible sequence of conditions). However, when interpreting stochastic modelling, which is based on a wide range of potential conditions that might happen to occur, it is essential to understand that calculations will encompass a much larger area than could be affected in any single spill event, where a more limited set of conditions will occur. Consequently, it is misleading to imply that the region derived from stochastic modelling indicate the outcomes expected from a single spill event (NOPSEMA, 2017) Stochastic modelling is generally used for risk assessment and preparedness planning by indicating locations that could be exposed and may require response or subsequent impact assessment
World Ocean Atlas	A collection of objectively analysed quality controlled physicochemical parameters (e.g., temperature, salinity, oxygen, phosphate, silicate, and nitrate) based on profile data from the World Ocean Database established by NOAA's National Centers for Environmental Information (NCEI)

EXECUTIVE SUMMARY

Background

ConocoPhillips Australia SH1 Pty Ltd (ConocoPhillips) is considering an exploration drilling campaign in Permit VIC/P79 in the Otway Basin. To support environmental approvals, an oil spill modelling study was undertaken to assess the potential exposure for the following scenarios:

- **Scenario 1** – An uncontrolled subsea loss of well control (LOWC) releasing a total of 139,400 m³ of condensate over 90 days (1,549 m³/day); and
- **Scenario 2** – A 350 m³ release of Marine Diesel Oil (MDO) over 6 hours from a loss of containment following a vessel collision.

Both scenarios were modelled from four worst case target locations due to the extent of the permit area.

The potential exposure to the surrounding waters and shorelines were assessed for summer (October to March) and winter (April to September) seasons.

One of the purposes of the modelling is to define the 'outer boundaries' of the environment that may be affected (EMBA) in the unlikely event of a hydrocarbon release scenario. Therefore, the modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

Methodology

The modelling study was carried out in stages. Firstly, a 10-year current dataset (2010 – 2019) that includes the combined influence of large-scale ocean and nearshore tidal currents were prepared. Secondly, the currents, local winds and detailed hydrocarbon characteristics were used as inputs in the three-dimensional oil spill model (SIMAP) to simulate the drift, spread, weathering and fate of the spilled hydrocarbons.

Modelling was conducted using a stochastic approach, which involved running 100 spills for each season, for each scenario and location with each simulation having the same information (i.e., location volume and oil properties) but randomly selected start times to ensure a range of wind and current conditions were assessed. Once all 100 simulations were run for a given scenario and location, the results were combined to determine the seasonal exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA 2019).

Hydrocarbon Properties

Thylacine condensate was used as a proxy for the LOWC scenario (Scenario 1), which has an API of 44.3, a density of 805 kg/m³ (at 15°C) and a low viscosity value of 0.875 cP. The volatile to semi-volatile components (boiling point (BP) < 265 °C), which represent approximately 83% of the whole condensate is likely to evaporate over the first day if exposed to the atmosphere at local temperatures, leaving the less volatile portion (16%) to progressively evaporate more slowly. Only 1% of the condensate is considered persistent.

Thylacine condensate is categorised as a Group I oil (non – persistent oil) according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges. The heavier components (i.e., low volatile portion) of the condensate will tend to entrain into the upper water column

during the presence of moderate winds (> 10 knots) and can potentially remain entrained for as long as the winds persist. But can subsequently resurface when the winds ease, and waves abate.

The MDO used as model input for Scenario 2 has a density of 829.1 kg/m³ (API gravity of 37.6) and a dynamic viscosity of 4.0 cP at 25°C. The MDO is characterised by a high percentage of volatile components (95%), which will evaporate when on the sea surface. It also contains 5% persistent hydrocarbons, which will not evaporate, though will decay over time. Additionally, the MDO classified as a Group II light persistent oil. It is important to note that some heavy components contained in MDO have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e., >12 knots) and breaking waves, but can re-float to the surface when the winds ease.

Key Findings

Location 1 LOWC

- The maximum distances to the low (1 g/m²) and moderate (10 g/m²) floating oil exposure thresholds was 306.7 km (winter) and 11.6 km (summer), respectively. No floating oil exposure at the high (50 g/m²) threshold was predicted.
- The highest probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) occurred during winter (100%), while the minimum time before shoreline accumulation was 4.08 days also during winter. The maximum volume of oil ashore was predicted during the winter with 51.9 m³.
- The maximum distances from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 748 km (winter), 625 km (summer) and 367 km (summer), respectively.
- The maximum distances from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 868 km (summer) and 699 km (summer), respectively.

Location 2 LOWC

- The maximum distances of floating oil exposure to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) thresholds was 179.2 km (summer), 11.1 km (summer) and 0.4 km (winter), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was 100% during both summer and winter, while the minimum time before shoreline accumulation at the low threshold was 3.63 days predicted during winter. The maximum total volume of oil ashore was predicted during the winter with 139.7 m³ (over the duration of the simulation).
- Maximum distances from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 758 km (summer), 584 km (winter) and 338 km (winter), respectively.
- The maximum distances of entrained hydrocarbons to the low (10 ppb) and high (100 ppb) thresholds was 879 km (summer) and 477 km (winter), respectively.

Location 3 LOWC

- The maximum distances to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 175.7 km (winter), 10.1 km (summer and winter) and 0.4 km (summer and winter), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was 100% during summer and winter, while the minimum time before shoreline accumulation at the low threshold was 3.79 days predicted during summer. The maximum volume of oil ashore was predicted during the winter with 140.0 m³.
- Maximum distances from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 804 km (summer), 451 km (winter) and 319 (summer), respectively.
- The maximum distances on to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 897 km (summer) and 450 km (winter), respectively.

Location 4 LOWC

- The maximum distances from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 363.4 km (winter), 12.3 km (winter) and 0.2 km (summer and winter), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was 100% during summer and winter, while the minimum time before shoreline accumulation was 1.92 days predicted during winter. The maximum volume of oil ashore was predicted during the winter with 318.9 m³.
- Maximum distances from the release location to the low (10 ppb), moderate (50 ppb) and high (400 ppb) dissolved hydrocarbon exposure thresholds was 686 km (winter), 456 km (summer) and 264 km (summer), respectively.
- The maximum distances from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 902 km (summer) and 426 km (summer), respectively.

Location 1 Vessel Collision

- The maximum distances to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 52.8 km (winter), 15.9 km (winter) and 4.3 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during winter at 29%, while the minimum time before shoreline accumulation was 4.83 days predicted during summer. The maximum volume of oil ashore was predicted during the winter with 16.6 m³.
- Maximum distances from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 125 km (winter) and 13 km (summer), respectively. No exposure at the high (400 ppb) dissolved hydrocarbon exposure threshold was predicted.
- The maximum distances from the release location to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 700 km (winter) and 158 km (winter), respectively.

Location 2 Vessel Collision

- The maximum distances to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 59.9 km (winter), 21.2 km (summer) and 5.5 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during summer at 45%, while the minimum time before shoreline accumulation occurred 1.83 days after the initial release for a spill during winter. The maximum volume of oil ashore was predicted during the winter with 28.9 m³.
- Maximum distances from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 159 km (winter) and 6 km (summer and winter), respectively. No exposure at the high (400 ppb) threshold was predicted.
- The maximum distances to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 446 km (winter) and 185 km (winter), respectively.

Location 3 Vessel Collision

- The maximum distances to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 51.8 km (summer), 19.8 km (winter) and 8.0 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during summer at 41%, while the minimum time before accumulation was 3.17 days predicted during winter. The maximum volume of oil ashore was predicted during the winter with 18.0 m³.
- The maximum distances from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 121 km (winter) and 3 km (summer), respectively. No exposure at the high (400 ppb) threshold was predicted.
- The maximum distances to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 489 km (winter) and 187 km (winter), respectively.

Location 4 Vessel Collision

- The maximum distances from the release location to the low (1 g/m²), moderate (10 g/m²) and high (50 g/m²) floating oil exposure thresholds was 62.3 km (winter), 20.7 km (winter) and 5.7 km (summer), respectively.
- The probability of accumulation on any shoreline at, or above, the low threshold (10 g/m²) was greatest during summer at 85%, while the minimum time for the accumulation was 1.08 days during winter. The maximum volume of oil ashore was predicted during the winter with 43.0 m³.
- The maximum distances from the release location to the low (10 ppb) and moderate (50 ppb) dissolved hydrocarbon exposure thresholds was 119 km (winter) and 24 km (winter), respectively. No exposure at the high (400 ppb) threshold was predicted.
- The maximum distances to the low (10 ppb) and high (100 ppb) entrained hydrocarbon thresholds was 598 km (winter) and 206 km (winter), respectively.

1 BACKGROUND

1.1 Introduction

ConocoPhillips Australia SH1 Pty Ltd (ConocoPhillips) is considering an exploration drilling campaign in Permit VIC/P79 in the Otway Basin. To support environmental approvals, Xodus on behalf of ConocoPhillips had commissioned RPS to undertake an oil spill modelling study to assess the potential exposure for the following scenarios:

- **Scenario 1** – An uncontrolled subsea loss of well control (LOWC) releasing a total of 139,400 m³ of condensate over 90 days (1,549 m³/day); and
- **Scenario 2** – A 350 m³ release of Marine Diesel Oil (MDO) over 6 hours from a loss of containment following a vessel collision.

Both scenarios were modelled from 4 worst case target locations due to the extent of the permit area, Table 1.1 presents the coordinates of the release locations and Figure 1.1 is the location map.

The potential exposure to the surrounding waters and shorelines were assessed for summer (October to March) and winter (April to September) seasons.

One of the purposes of the modelling is to define the 'outer boundaries' of the environment that may be affected (EMBA) in the unlikely event of a hydrocarbon release scenario. Therefore, the modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

The hydrocarbon spill model, the method and analysis applied herein uses modelling algorithms which have been peer reviewed and published in international journals. Further, RPS warrants that this work meets and exceeds the American Society for Testing and Materials (ASTM) Standard F2067-13 "Standard Practice for Development and Use of Oil Spill Models".

Table 1.1 VIC/P79 hydrocarbon spill modelling release locations.

Release location	Name	Latitude*	Longitude*	Water depth (m)
Location 1	Essington	39° 5' 17.4" S	142° 48' 23.1" E	93
Location 2	Regia	38° 43' 20.6" S	142° 26' 35.3" E	74
Location 3	Merope	38° 5' 8.9" S	142° 5' 8.9" E	66
Location 4	Julpha	38° 30' 6.4" S	142° 7' 55.5" E	45

*Datum: WGS 1984

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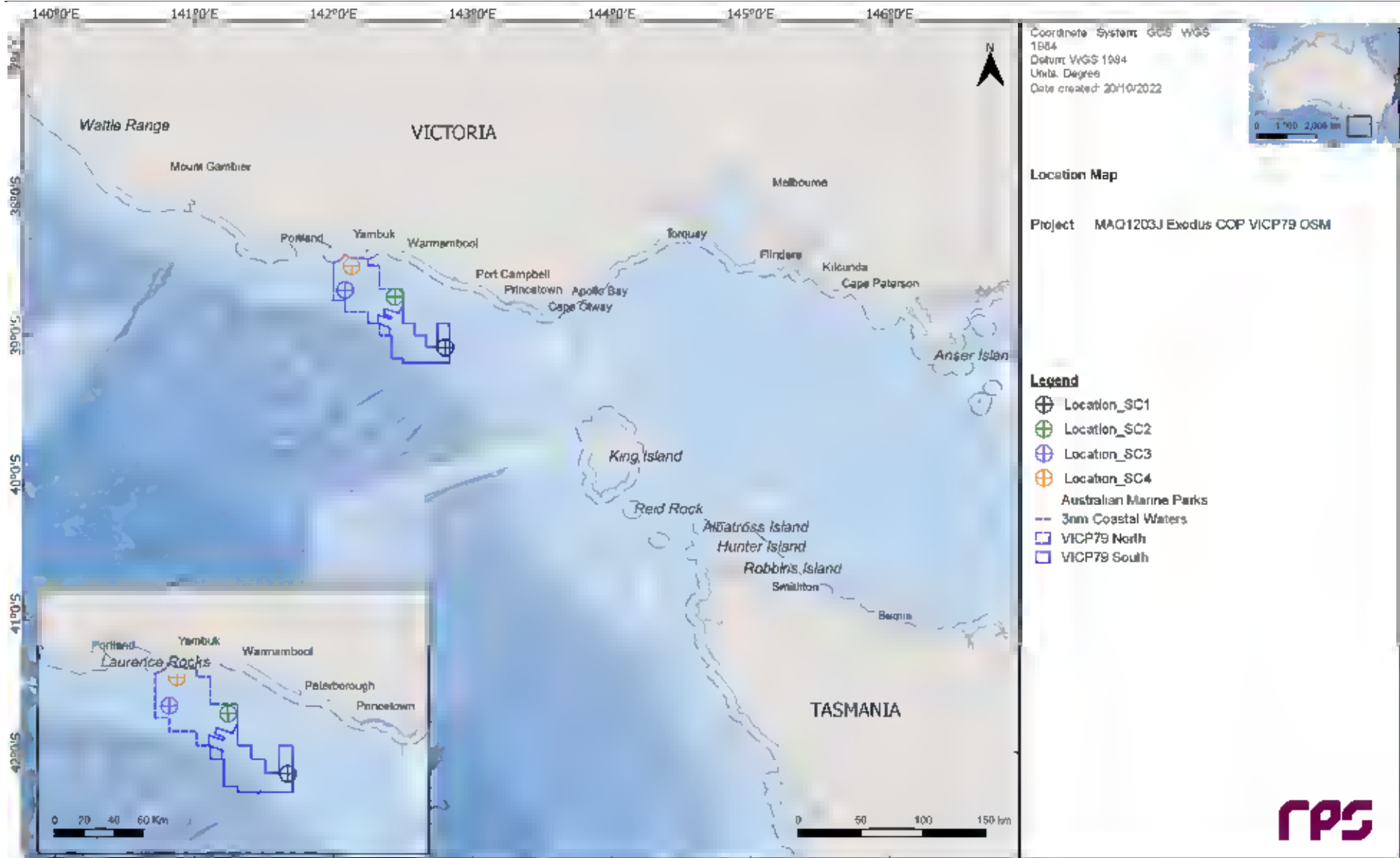


Figure 1.1 VIC/P79 hydrocarbon spill modelling release locations.

1.2 What is Oil Spill Modelling?

Oil spill modelling is a valuable tool widely used for risk assessment, emergency response and contingency planning where it can be particularly helpful to proponents and decision makers. By modelling a series of the most likely oil spill scenarios, decisions concerning suitable response measures and strategic locations for deploying equipment and materials can be made, and the locations at most risk can be identified. The two types of oil spill modelling often used are stochastic (Section 1.2.1) and deterministic (Section 1.2.2) modelling.

1.2.1 Stochastic Modelling (Multiple Spill Simulations)

Stochastic oil spill modelling is created by overlaying a great number (often hundreds) of individual, computer-simulated hypothetical spills (NOPSEMA, 2018; Figure 1.2).

Stochastic modelling is a common means of assessing the potential risks from oil spills related to new projects and facilities. Stochastic modelling typically utilises hydrodynamic data for the location in combination with historic wind data. Typically, 100 iterations of the model will be run utilising the data that is most relevant to the season or timing of the project.

The outcomes are often presented as a probability of exposure and is primarily used for risk assessment purposes in view to understand the range of environments that may be affected or impacted by a spill. Elements of the stochastic modelling can also be used in oil spill preparedness and planning.

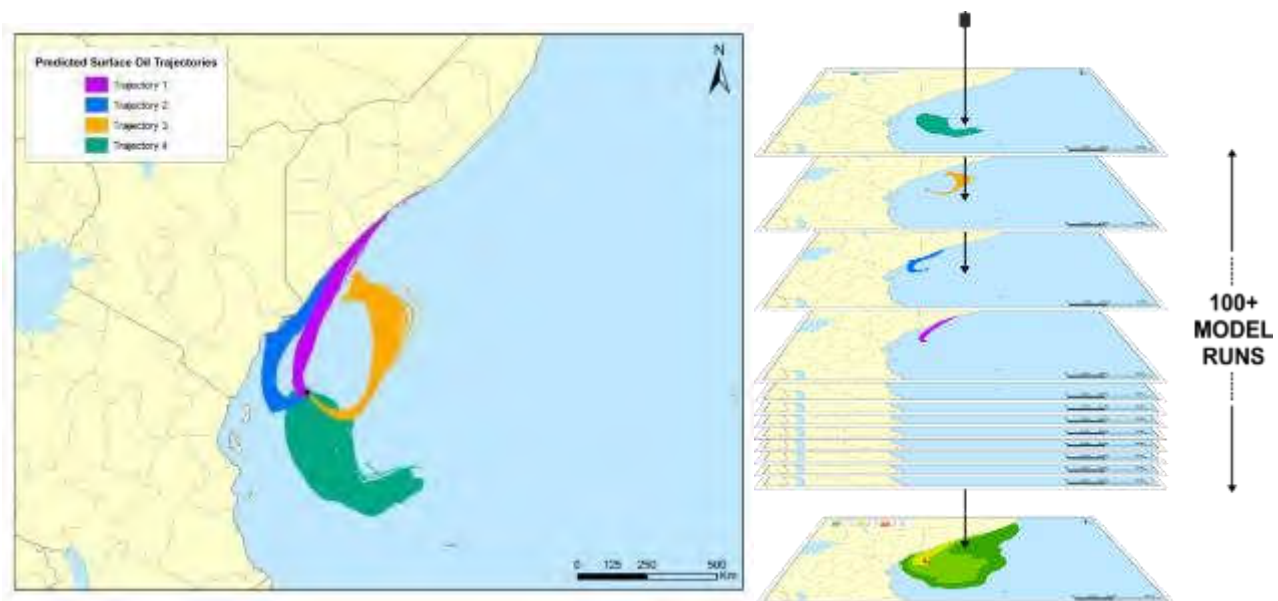


Figure 1.2 Examples of four individual spill trajectories (four replicate simulations) predicted by SIMAP for a spill scenario. The frequency of contact with given locations is used to calculate the probability of impacts during a spill. Essentially, all model runs are overlain (shown as the stacked runs on the right) and the number of times that trajectories contact a given location at a concentration is used to calculate the probability.

1.2.2 Deterministic Modelling (Single Spill Simulation)

Deterministic modelling is the predictive modelling of a single incident subject to a single sample of wind and weather conditions over time (NOPSEMA, 2018; Figure 1.3).

Deterministic modelling is often paired with stochastic modelling to place the large stochastic footprint into perspective. This deterministic analysis is generally a single run selected from the stochastic analysis and serves as the basis for developing the plans and equipment needs for a realistic spill response. Deterministic spills can be selected on based on parameters such as minimum time to shoreline, largest swept area, maximum volume ashore and longest length of shoreline contacted by hydrocarbons.

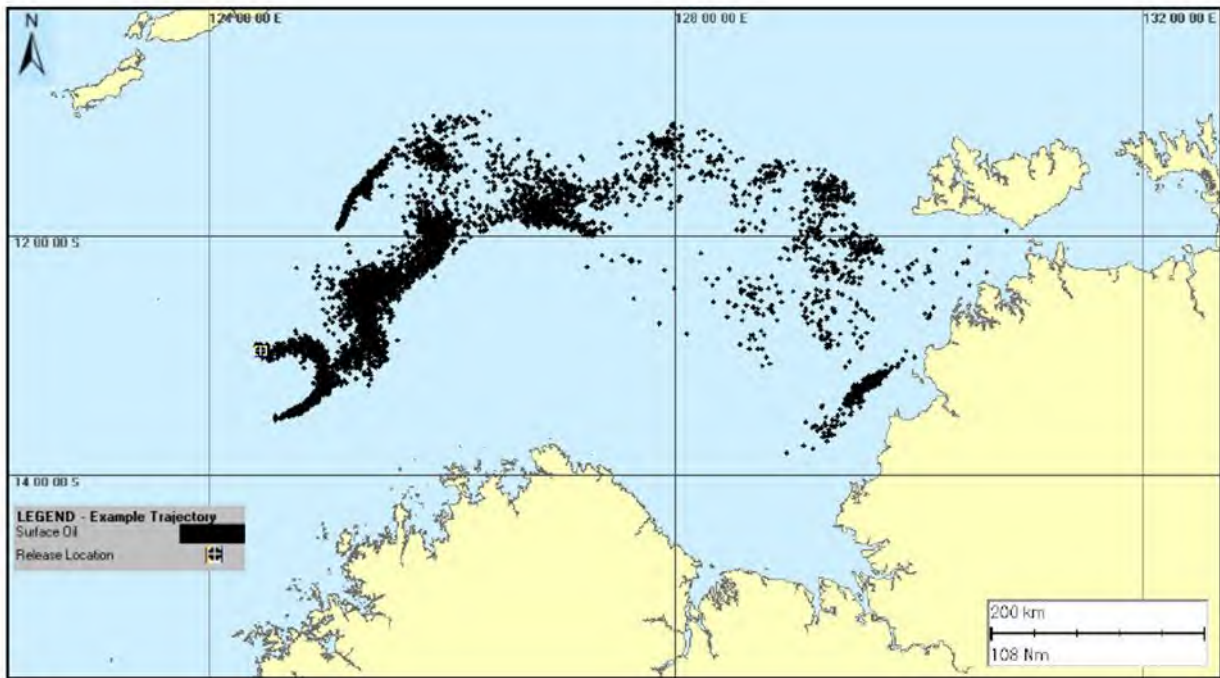


Figure 1.3 Example of an individual spill trajectory predicted by SIMAP for a spill scenario. Note, this image represents surface oil as spill and does not take any thresholds into consideration.

2 SCOPE OF WORK

The scope of work included the following components:

1. Generate 10 years (2010 to 2019 (inclusive)) of wind and current data. The three-dimensional current data includes the combined influence of ocean and tidal currents;
2. Include the wind and current data and the hydrocarbon characteristics as input into the three-dimensional oil spill model, SIMAP, to model the movement, spreading, weathering and shoreline accumulation by hydrocarbons over time;
3. Run 100 oil spill simulations per season (200 total per location for each scenario), with each simulation having the same spill information (i.e., location volume and condensate properties) but varying start times. This ensured that each spill trajectory was subjected to a unique set of wind and current conditions;
4. Combine the results from the 100 spill simulations (per season) per location for each scenario to assess the exposure to waters and shoreline accumulation based upon the NOPSEMA thresholds;
5. Present the combined results from the 200 spill simulations, per location for each scenario, to assess the low threshold environment that maybe affected (EMBA); and
6. From the 200 simulations modelled for each location, identify and present the “worst case” deterministic run resulting in the maximum volume of hydrocarbons ashore. For each scenario and all the deterministic simulations resulting in: a) largest area of floating hydrocarbon exposure; b) minimum time to shoreline exposure; and c) longest length of shoreline accumulation were also identified for each scenario and presented.

3 REGIONAL CURRENTS

The Otway Basin lies within the western portion of the Bass Strait, a sea strait separating Tasmania from the southern Australian mainland. The strait is a relatively shallow area of the continental shelf, connecting the southeast Indian Ocean with the Tasman Sea. This region has a reputation for high winds and strong tidal currents (Jones, 1980). Currents are primarily driven by tides, winds and density driven flows. During winter the South Australian current moves dense, salty water eastward from the Great Australian Bight into the western margin of the Bass Strait (Sandery & Kämpf, 2007). In winter and spring, waters within the strait are well mixed with no obvious stratification, while during summer the central regions of the strait become stratified (Baines & Fandry, 1983; Middleton & Black, 1994).

Figure 3.1 displays seasonal current trends within the Otway Basin-Bass Strait region. During winter there is a strong eastward water flow due to the strengthening of the South Australian Current (fed by the Leeuwin Current in the Northwest Shelf), which bifurcates with one extension moving through the Bass Strait, and another forming the Zeehan Current off western Tasmania (Sandery & Kämpf, 2007). During summer, water flow reverses off Tasmania, King Island and the Otway Basin travelling eastward, as the coastal current develops due to south-easterly winds.

Therefore, to accurately account for the movement of an oil spill, which can move between the offshore and near shore region, ocean and tidal currents were combined as part of the study. The following sections provide a summary of the regional current data set.

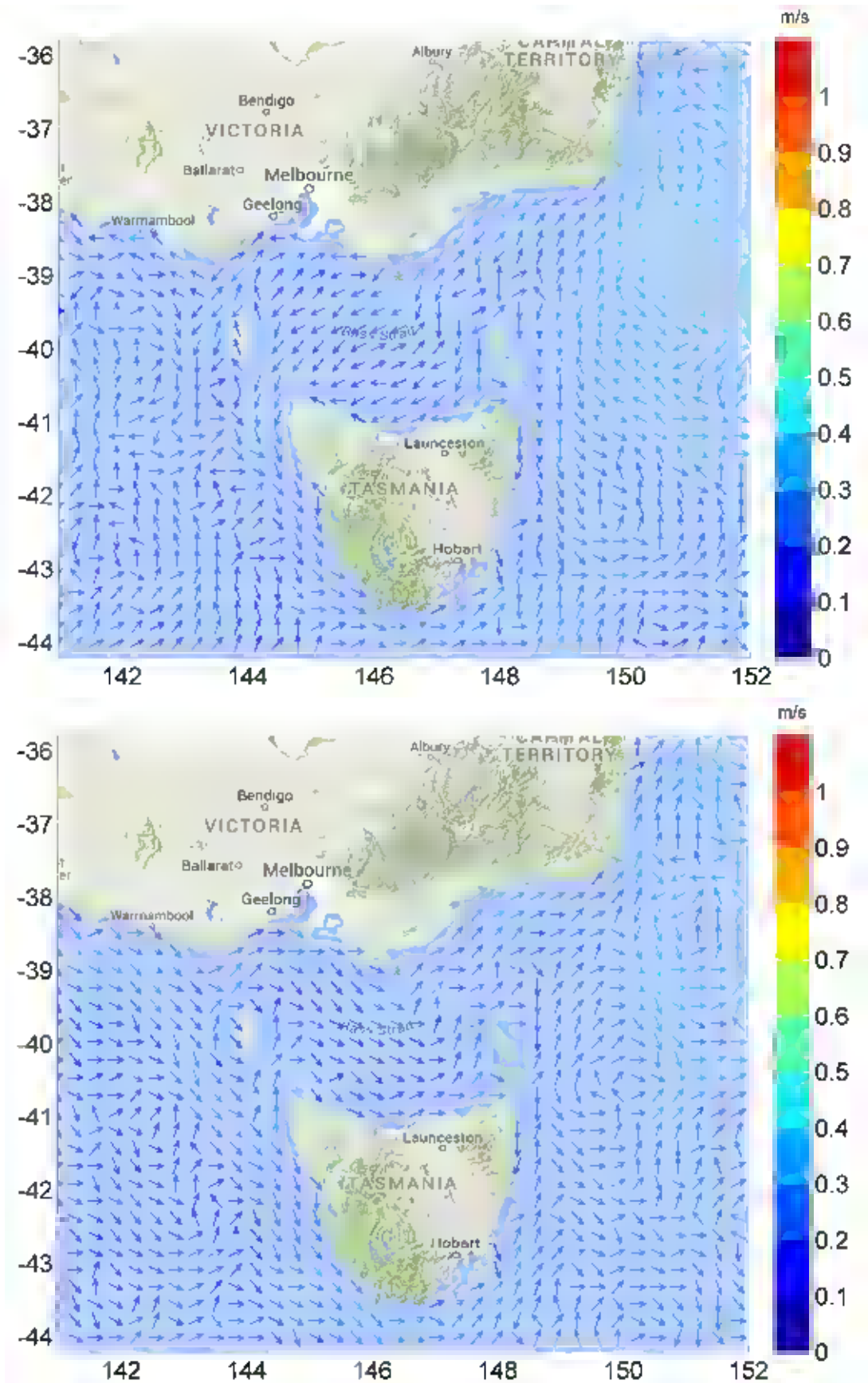


Figure 3.1 HYCOM averaged seasonal surface drift currents during summer (upper image) and winter (lower image).

3.1 Tidal currents

Tidal current data was generated using RPS's advanced ocean/coastal model, HYDROMAP. The HYDROMAP model has been thoroughly tested and verified through field measurements throughout the world for more than 30 years (Isaji & Spaulding, 1984; Isaji, et al., 2001; Zigic, et al., 2003). HYDROMAP tidal current data has been used as input to forecast (in the future) and hindcast (in the past) pollutant spills in Australian waters and forms part of the Australian National Oil Spill Emergency Response System operated by AMSA (Australian Maritime Safety Authority).

HYDROMAP employs a sophisticated sub-gridding strategy, which supports up to six levels of spatial resolution, halving the grid cell size as each level of resolution is employed. The sub-gridding allows for higher resolution of currents within areas of greater bathymetric and coastline complexity, and/or of interest to a study.

The numerical solution methodology follows that of Davies (1977a 1977b) with further developments for model efficiency by Owen (1980) and Gordon (1982). A more detailed presentation of the model can be found in Isaji & Spaulding (1984) and Isaji et al. (2001).

3.1.1 Grid Setup

The tidal model domain has been sub-gridded down to a resolution of 500 m for shallow and coastal regions, starting from an offshore (or deep water) resolution of 8 km. The finer grids were allocated in a step-wise fashion to resolve flows more accurately along the coastline, around islands and over regions with more complex bathymetry. Figure 3.2 shows the tidal model grid covering the study domain.

A combination of datasets was used and merged to describe the shape of the seabed within the grid domain (Figure 3.3). These included spot depths and contours which were digitised from nautical charts released by the hydrographic offices as well as Geoscience Australia database and depths extracted from the Shuttle Radar Topography Mission (SRTM30_PLUS) Plus dataset (see Becker et al., 2009).

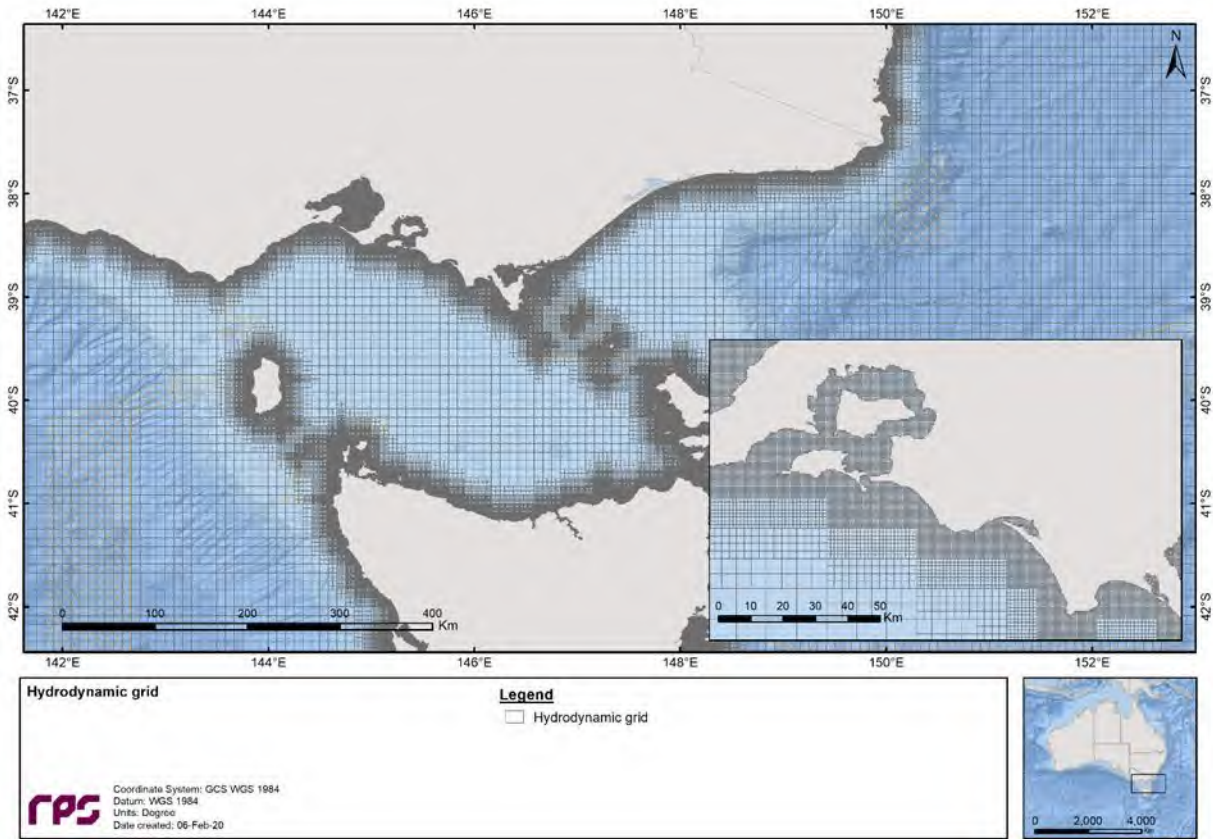


Figure 3.2 Sample of the model grid used to generate the tidal currents for the study region. Higher resolution areas are shown by the denser mesh.

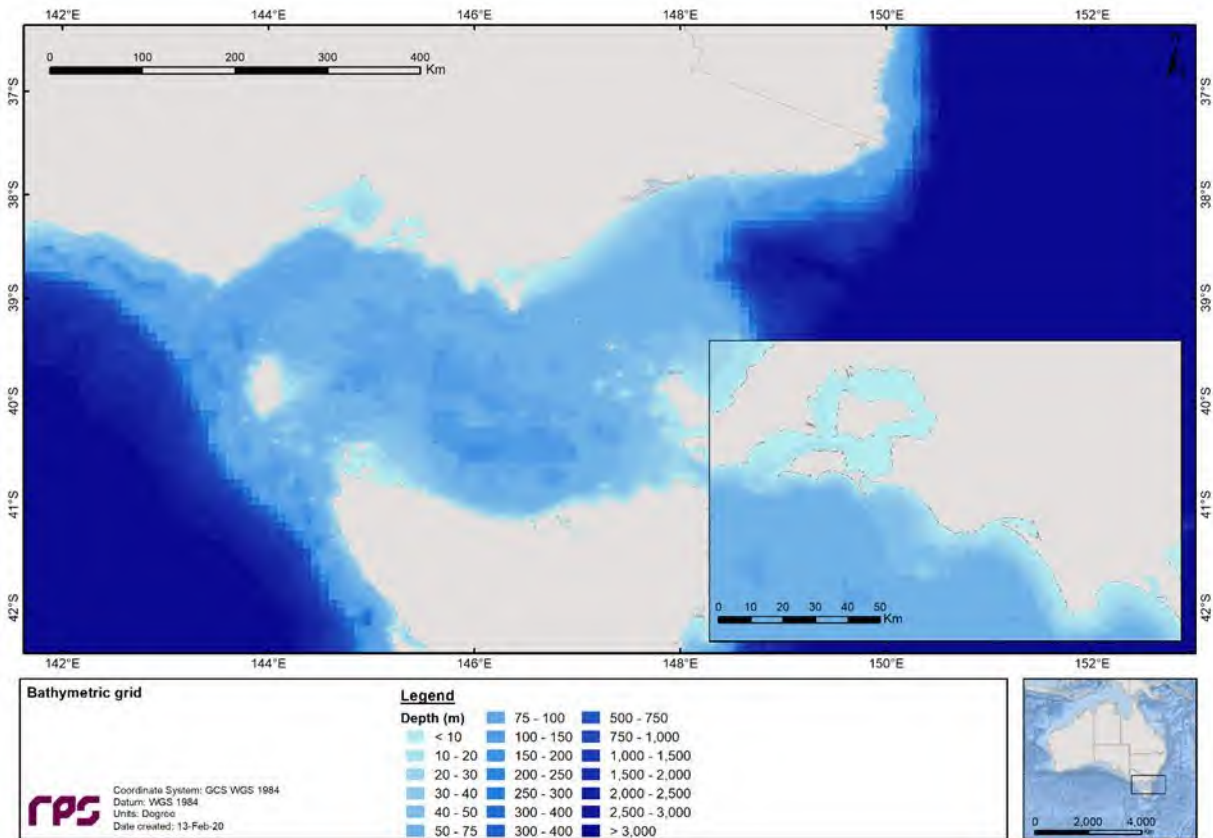


Figure 3.3 Bathymetry defined throughout the tidal model domain.

3.1.2 Tidal Conditions

The ocean boundary data for the regional model was obtained from satellite measured altimetry data (TOPEX/Poseidon 8.0) which provided estimates of the eight dominant tidal constituents at a horizontal scale of approximately 0.25 degrees. The eight major tidal constituents used were K_2 , S_2 , M_2 , N_2 , K_1 , P_1 , O_1 and Q_1 . Using the tidal data, time series surface heights were calculated along the open boundaries for the simulation period.

The Topex/Poseidon satellite data has a resolution of 0.25 degrees globally, with higher resolution in coastal regions, and is produced and quality controlled by NASA (National Aeronautics and Space Administration). The data capturing satellites, equipped with two altimeters capable of taking sea level measurements accurate to less than ± 5 cm, measured oceanic surface elevations (and the resultant tides) for the period 1992–2005. In total these satellites carried out 62,000 orbits of the planet. The Topex/Poseidon tidal data has been widely used amongst the oceanographic community, being referenced in more than 2,100 research publications (e.g., Andersen, 1995; Ludicone et al., 1998; Matsumoto et al., 2000; Kostianoy et al., 2003; Yaremchuk & Tangdong, 2004; Qiu & Chen, 2010). The Topex/Poseidon tidal data is considered suitably accurate for this study.

3.2 Ocean Currents

Data describing the flow of ocean currents was obtained from HYCOM (Hybrid Coordinate Ocean Model, (Chassignet et al., 2007), which is operated by the HYCOM Consortium, sponsored by the Global Ocean Data Assimilation Experiment (GODAE). HYCOM is a data-assimilative, three-dimensional ocean model that is run as a hindcast (for a past period), assimilating time-varying observations of sea surface height, sea surface temperature and in-situ temperature and salinity measurements (Chassignet et al., 2009). The HYCOM predictions for drift currents are produced at a horizontal spatial resolution of approximately 8.25 km (1/12th of a degree) over the region, at a frequency of three-times per day. HYCOM uses isopycnal layers in the open, stratified ocean, but uses the layered continuity equation to make a dynamically smooth transition to a terrain-following coordinate in shallow coastal regions, and to z-level coordinates in the mixed layer and/or unstratified seas.

For this study, the HYCOM hindcast currents were obtained for the years 2010 to 2019 (inclusive).

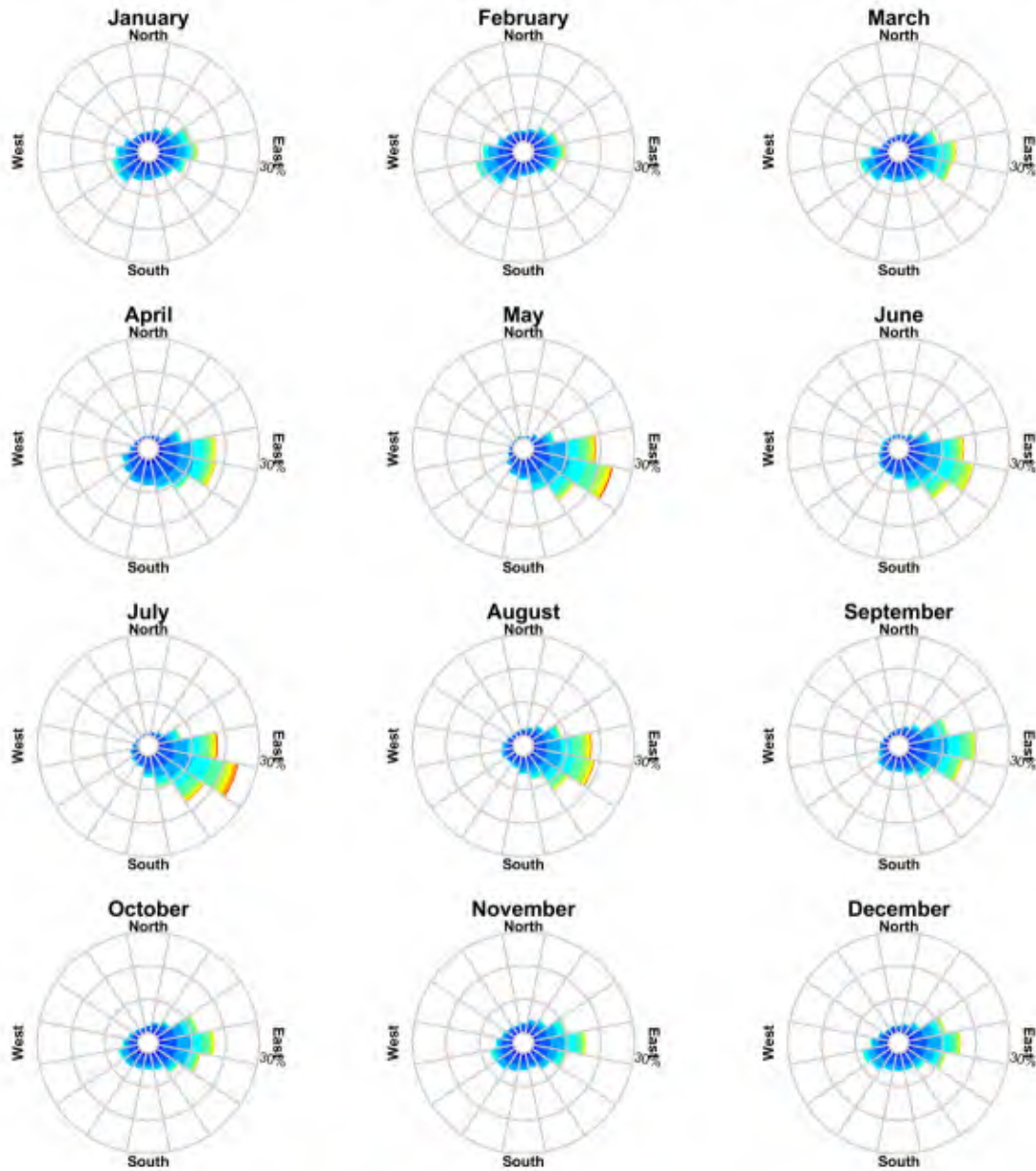
3.3 Surface Currents

Figure 3.4 to Figure 3.7 show the monthly current rose distributions for the four locations, while Figure 3.8 to Figure 3.11 illustrate the total current rose distributions for the four locations.

Note the convention for defining current direction is the direction the current flows towards, which is used to reference current direction throughout this report. Each branch of the rose represents the currents flowing to that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent the current speed ranges for each direction. Speed intervals of 0.1 m/s are predominantly used in these current roses. The length of each coloured segment is relative to the proportion of currents flowing within the corresponding speed and direction.

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 142.81°E, Latitude = 39.09°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019



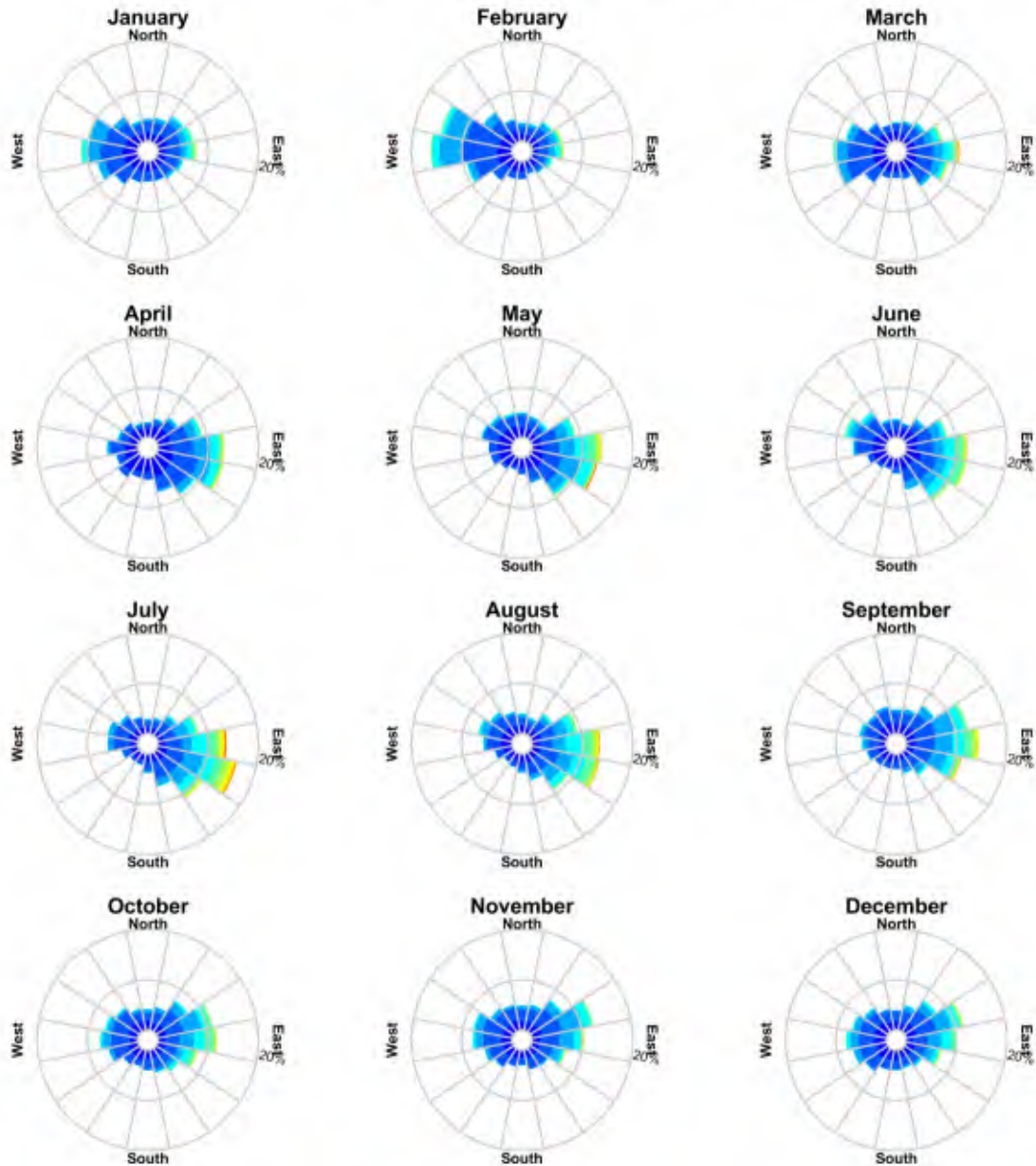
Color Key [Current Speed(m/s)] :



Figure 3.4 Monthly surface current rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 142.44°E, Latitude = 38.72°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019



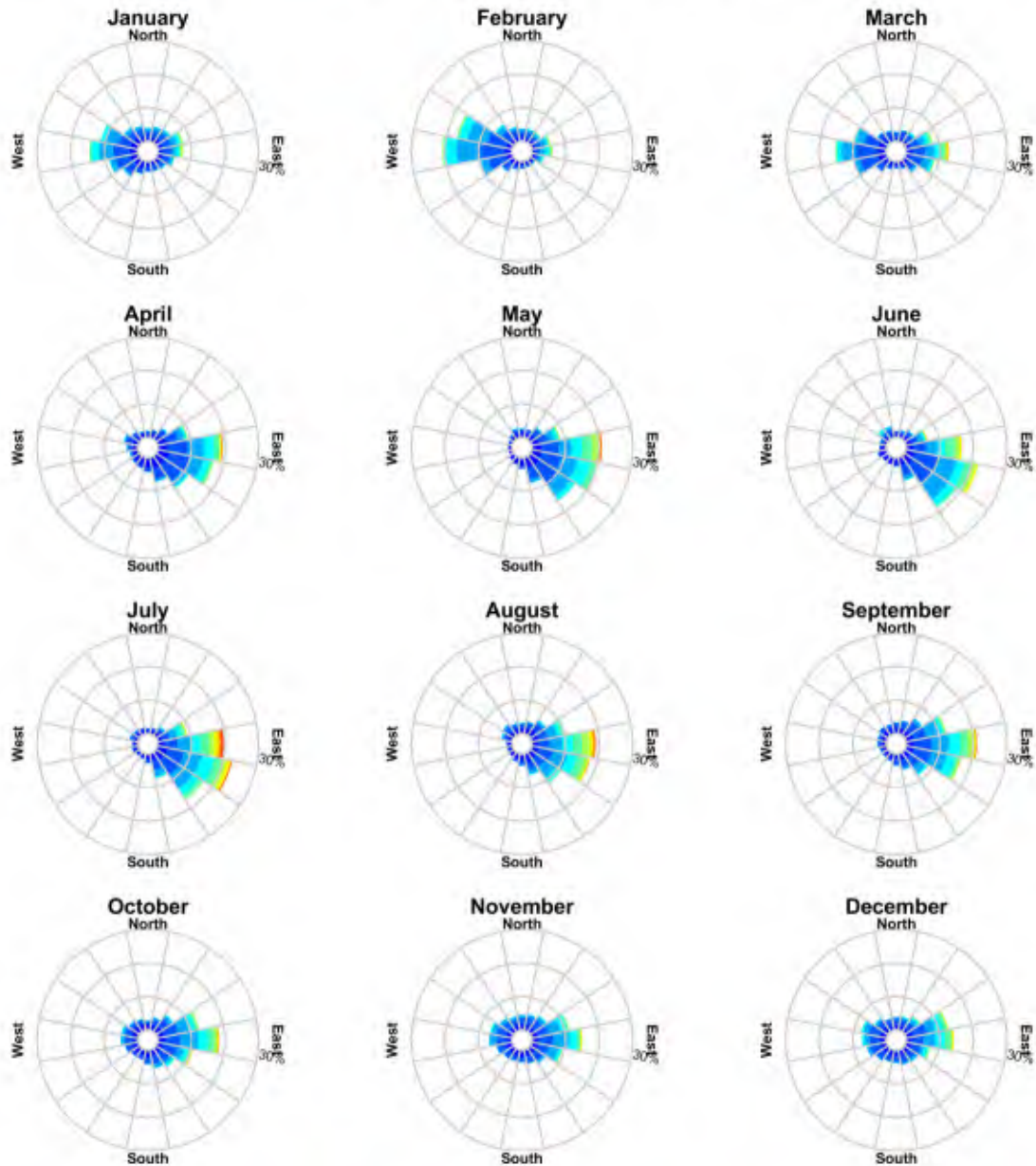
Color Key [Current Speed(m/s)] :



Figure 3.5 Monthly surface current rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 142.09°E, Latitude = 38.67°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019



Color Key [Current Speed(m/s)] :



Figure 3.6 Monthly surface current rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 142.13°E, Latitude = 38.50°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019

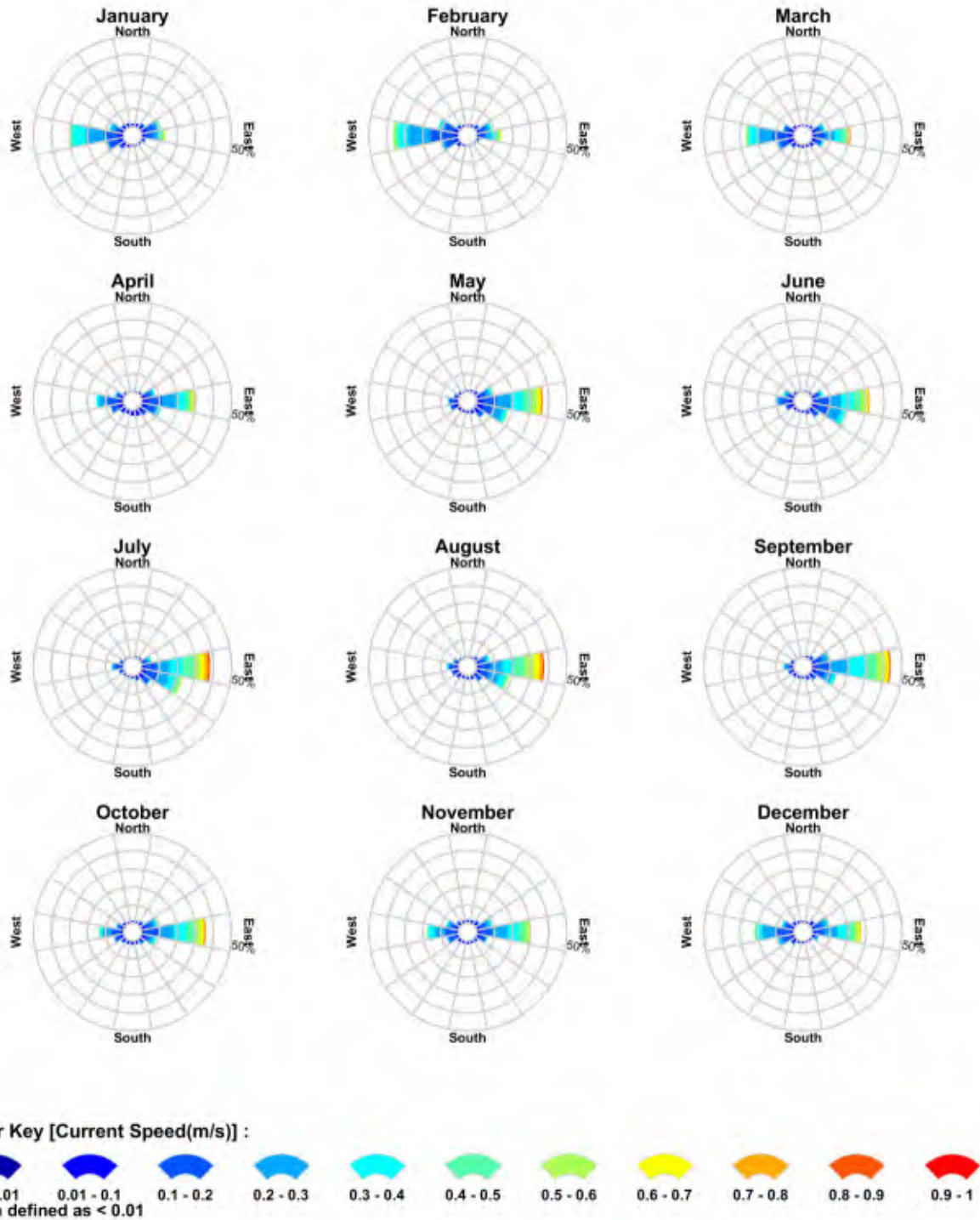


Figure 3.7 Monthly surface current rose plots for Location 4. Data is based on modelled conditions between 2010–2019 (inclusive).

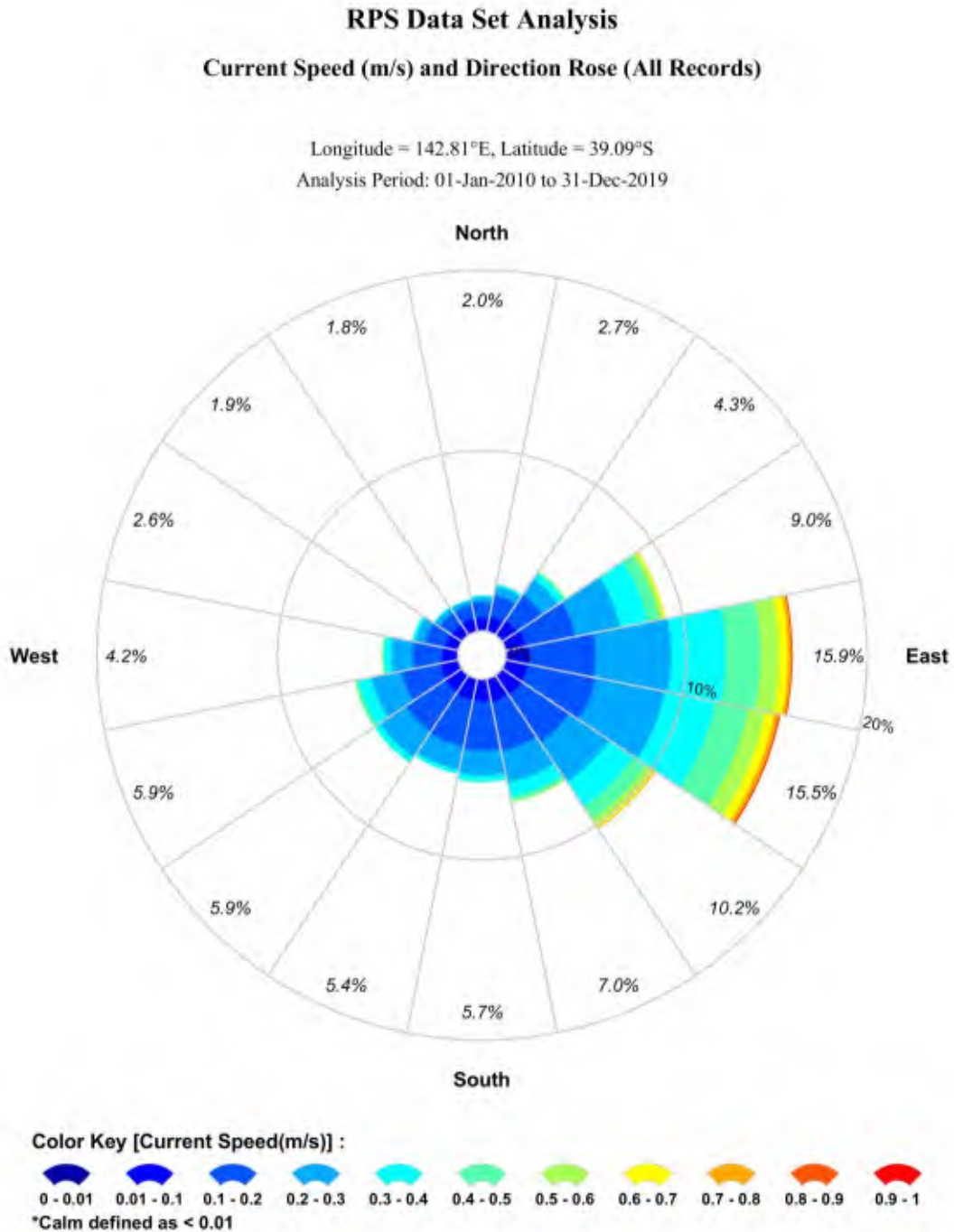


Figure 3.8 Total surface current rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

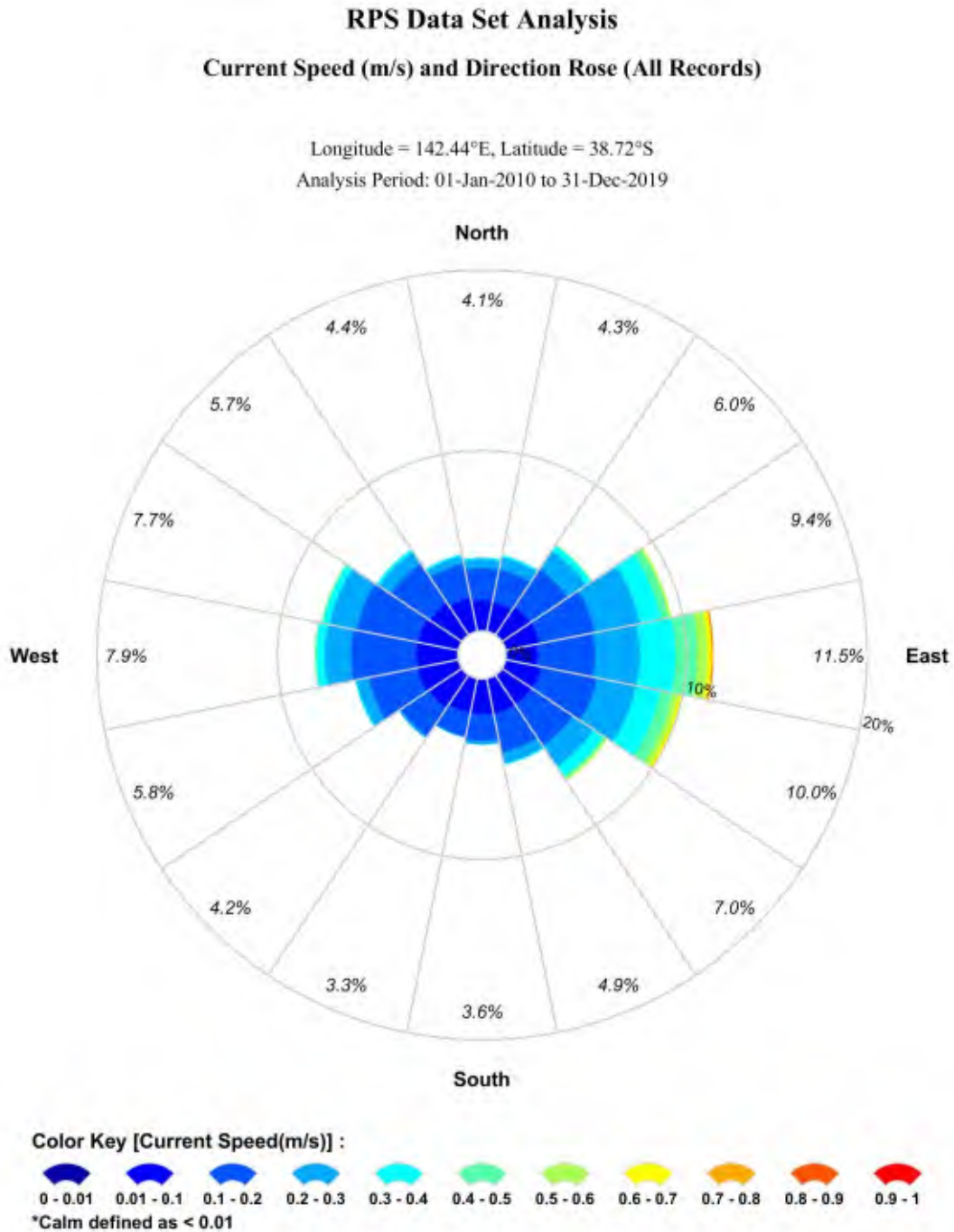


Figure 3.9 Total surface current rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Current Speed (m/s) and Direction Rose (All Records)

Longitude = 142.09°E, Latitude = 38.67°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019

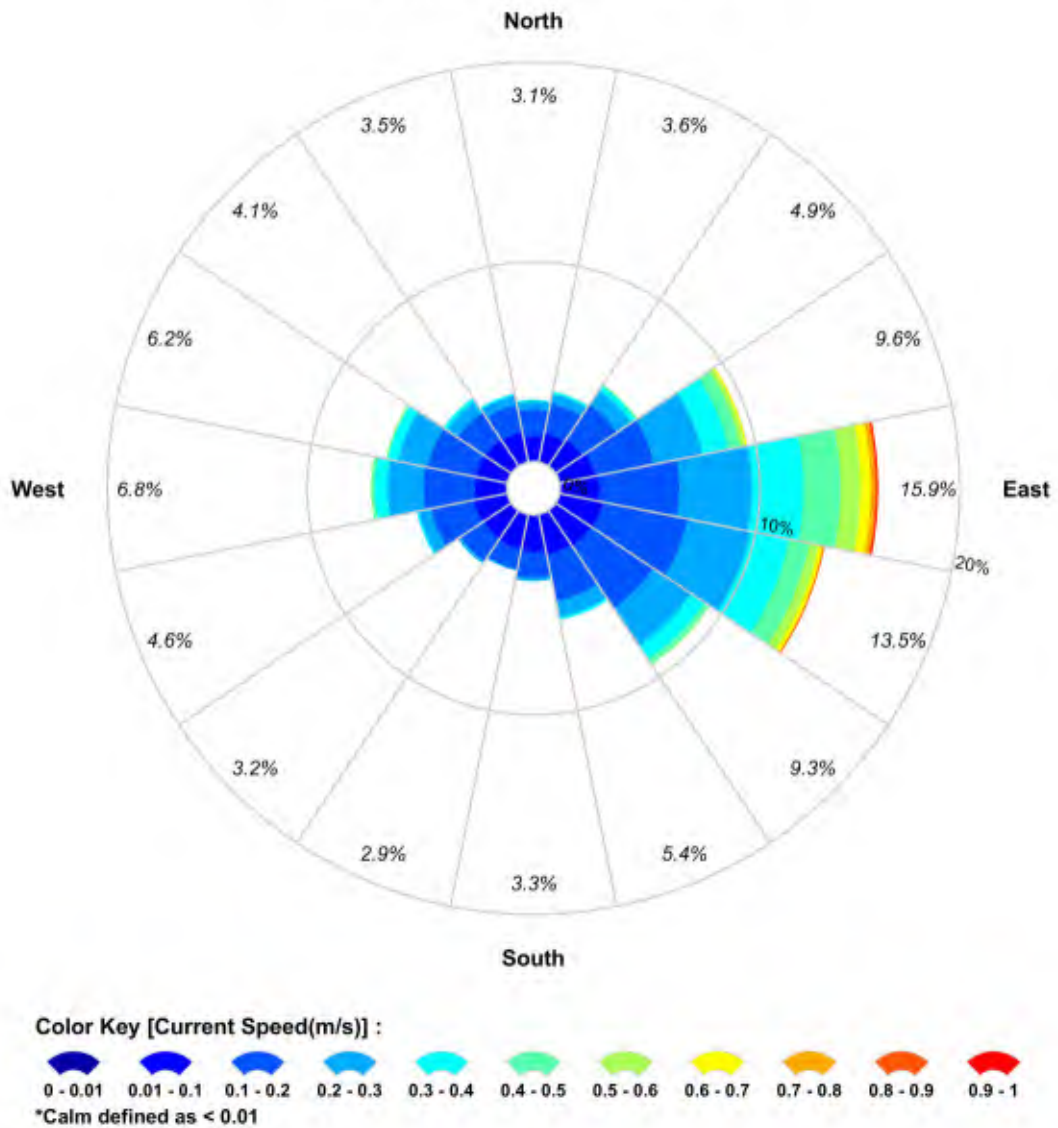


Figure 3.10 Total surface current rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

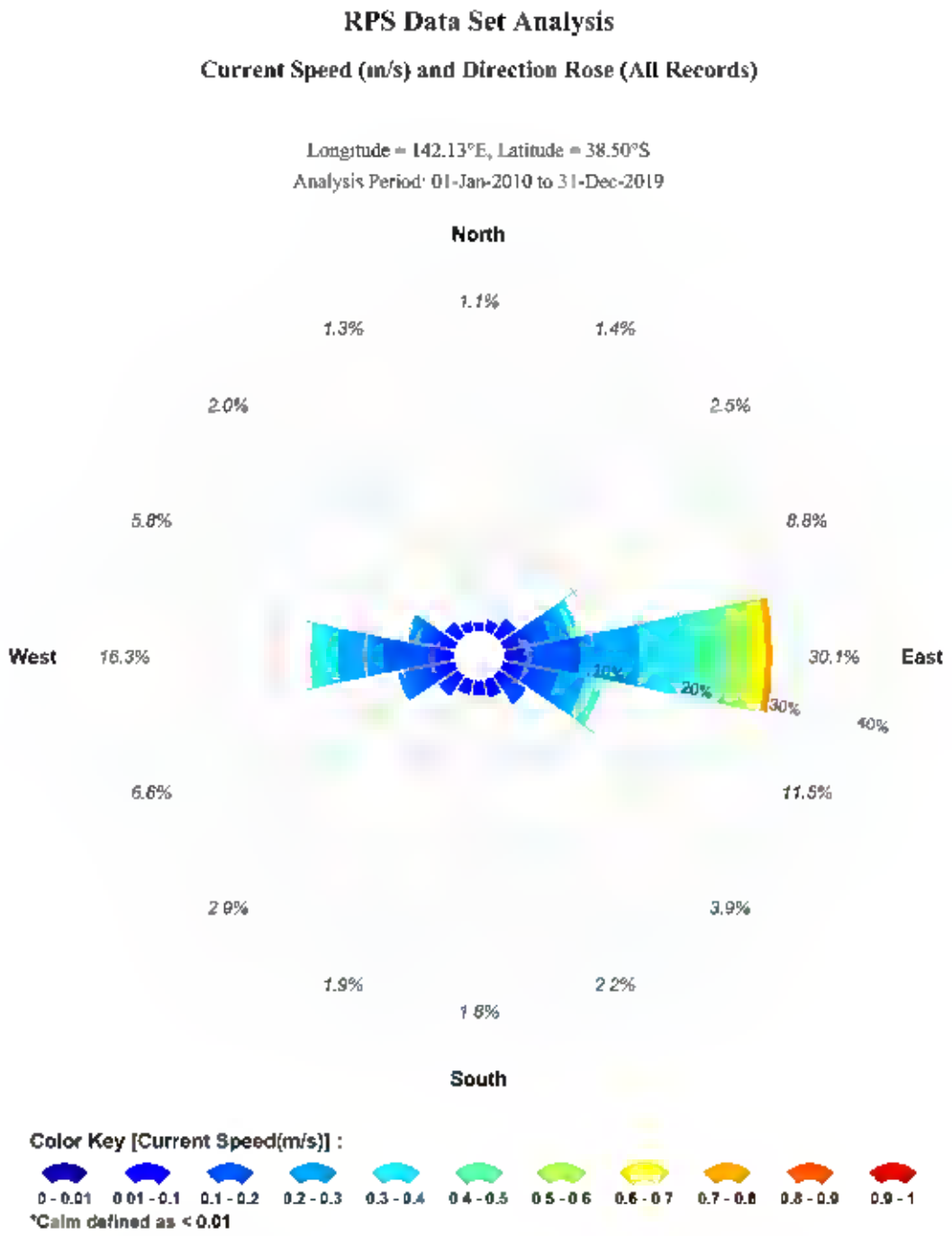


Figure 3.11 Total surface current rose plots for Location 4. Data is based on modelled conditions between 2010–2019 (inclusive).

4 WIND DATA

To account for the influence of the wind on the hydrocarbons floating on the surface, wind data from 2010 to 2019 (inclusive) was sourced from the National Centre for Environmental Prediction (NCEP) Climate Forecast System Reanalysis dataset (CFSR; see Saha et al., 2010). The CFSR wind model includes observations from many data sources: surface observations, upper-atmosphere air balloon observations, aircraft observations and satellite observations. The model is capable of accurately representing the interaction between the earth’s oceans, land and atmosphere. The gridded wind data output is available at a horizontal resolution of 0.25° (~33 km) and a temporal resolution of 1 hour.

Figure 4.1 is a screenshot illustrating the spatial resolution of the CFSR modelled wind data.

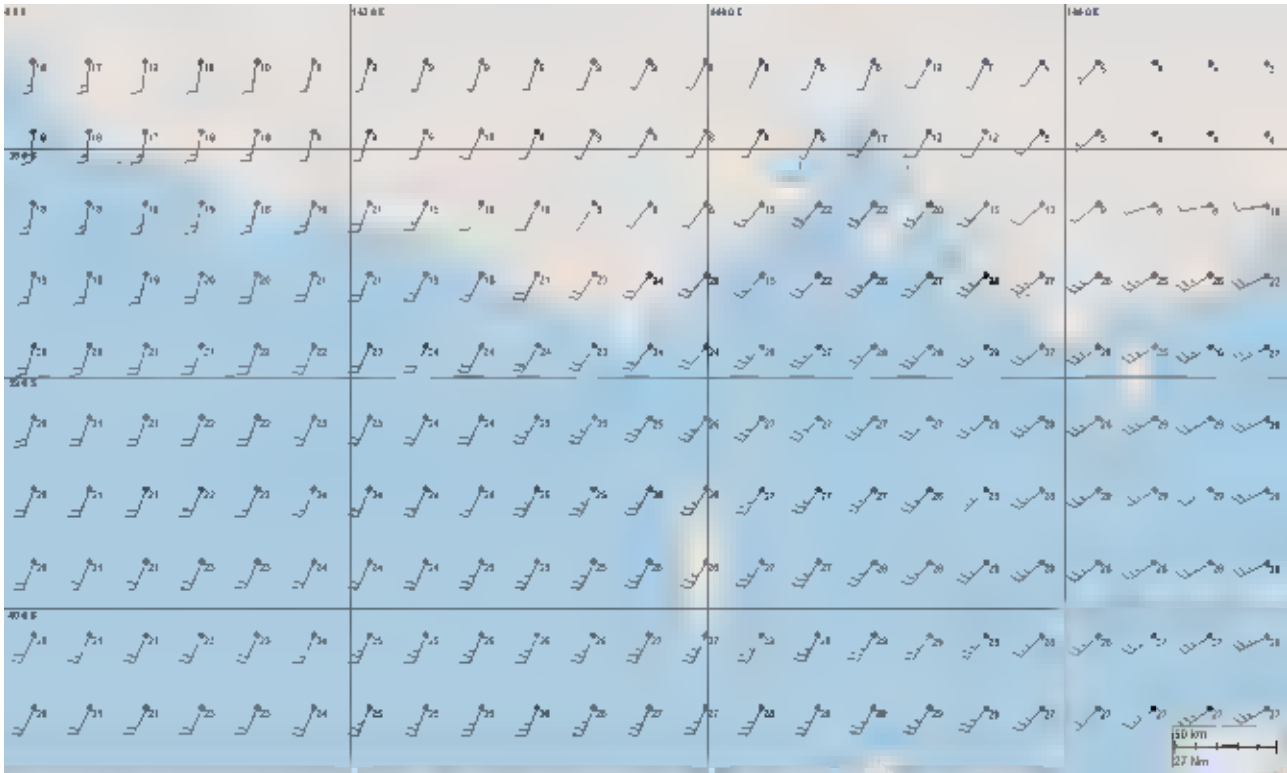


Figure 4.1 Spatial resolution of the CFSR modelled wind data used as input into the oil spill model.

Figure 4.2 to Figure 4.5 and Figure 4.6 to Figure 4.9 shows the monthly and total wind rose distributions derived from the CFSR nodes closest to the release locations, respectively.

Note that the atmospheric convention for defining wind direction, that is, the direction the wind blows from, is used to reference wind direction throughout this report. Each branch of the rose represents wind coming from that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent wind speed ranges from that direction. Speed ranges of 3 knots are predominantly used in these wind roses. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.81°E, Latitude = 39.09°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019

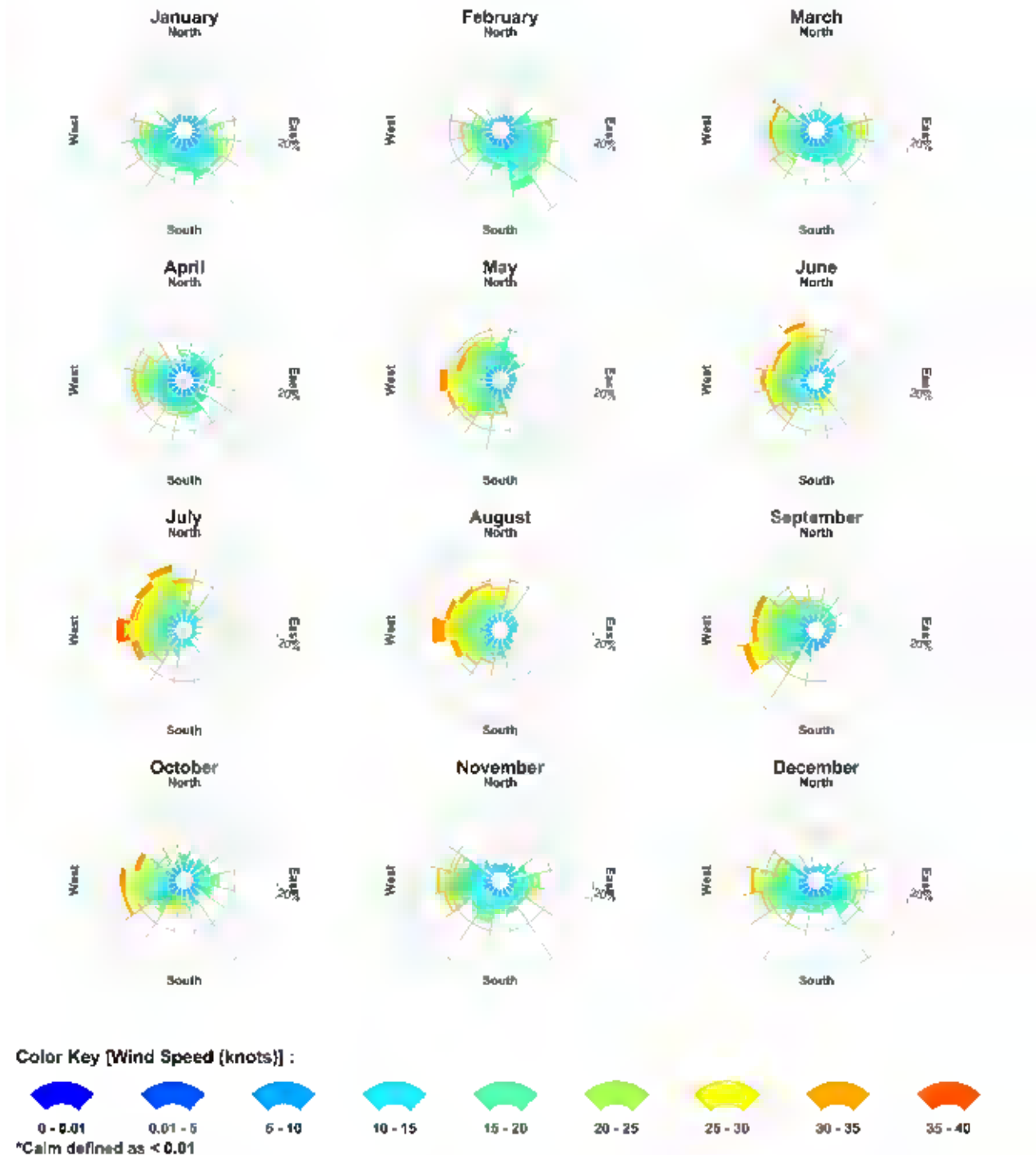
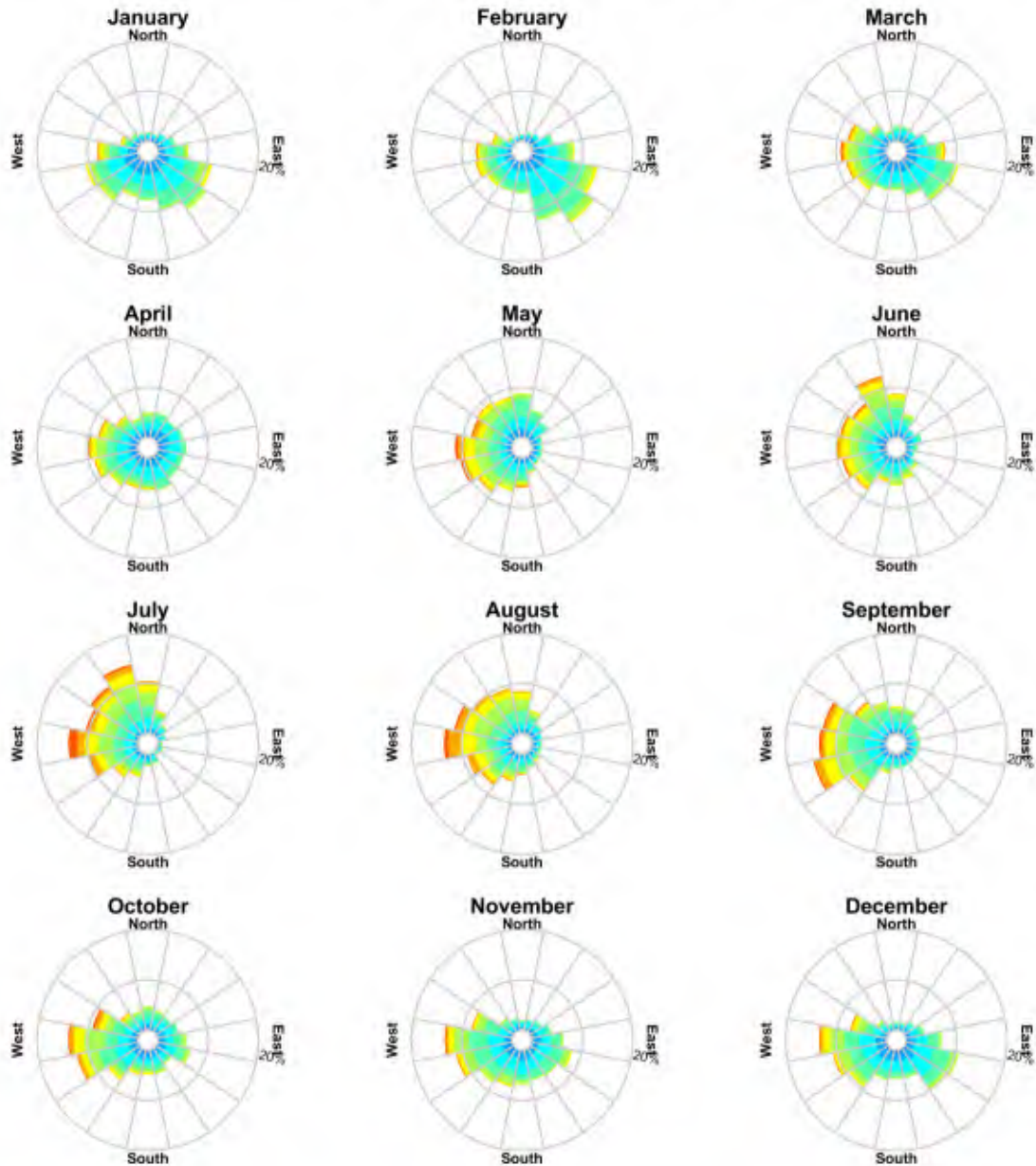


Figure 4.2 Monthly wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.44°E, Latitude = 38.72°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019



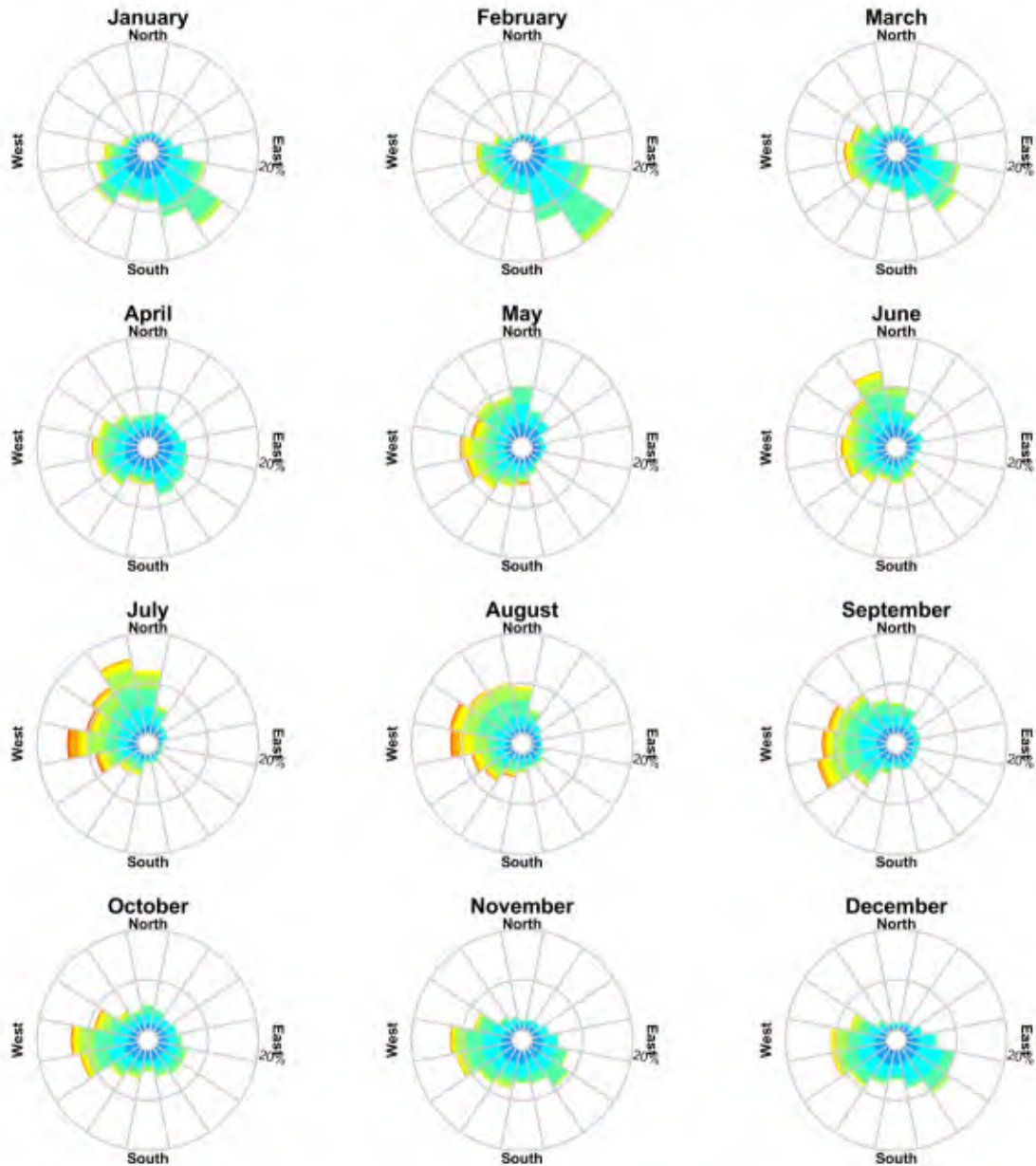
Color Key [Wind Speed (knots)] :



Figure 4.3 Monthly wind rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.09°E, Latitude = 38.67°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019



Color Key [Wind Speed (knots)] :

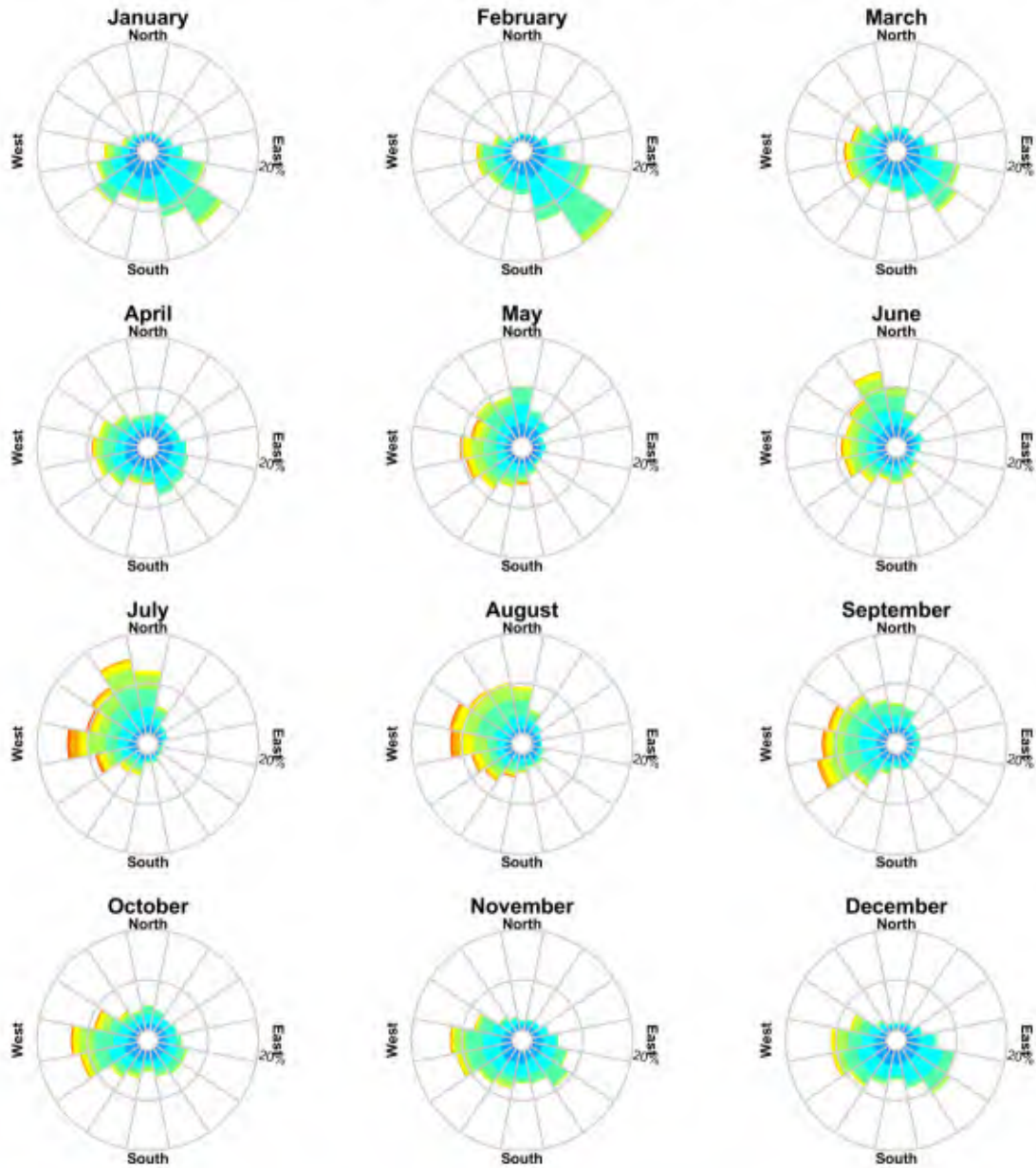


*Calm defined as < 0.01

Figure 4.4 Monthly wind rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.13°E, Latitude = 38.50°S
Analysis Period: 01-Jan-2010 to 31-Dec-2019



Color Key [Wind Speed (knots)] :



*Calm defined as < 0.01

Figure 4.5 Monthly wind rose plots for Location 4. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.81°E, Latitude = 39.09°S
 Analysis Period: 01-Jan-2010 to 31-Dec-2019

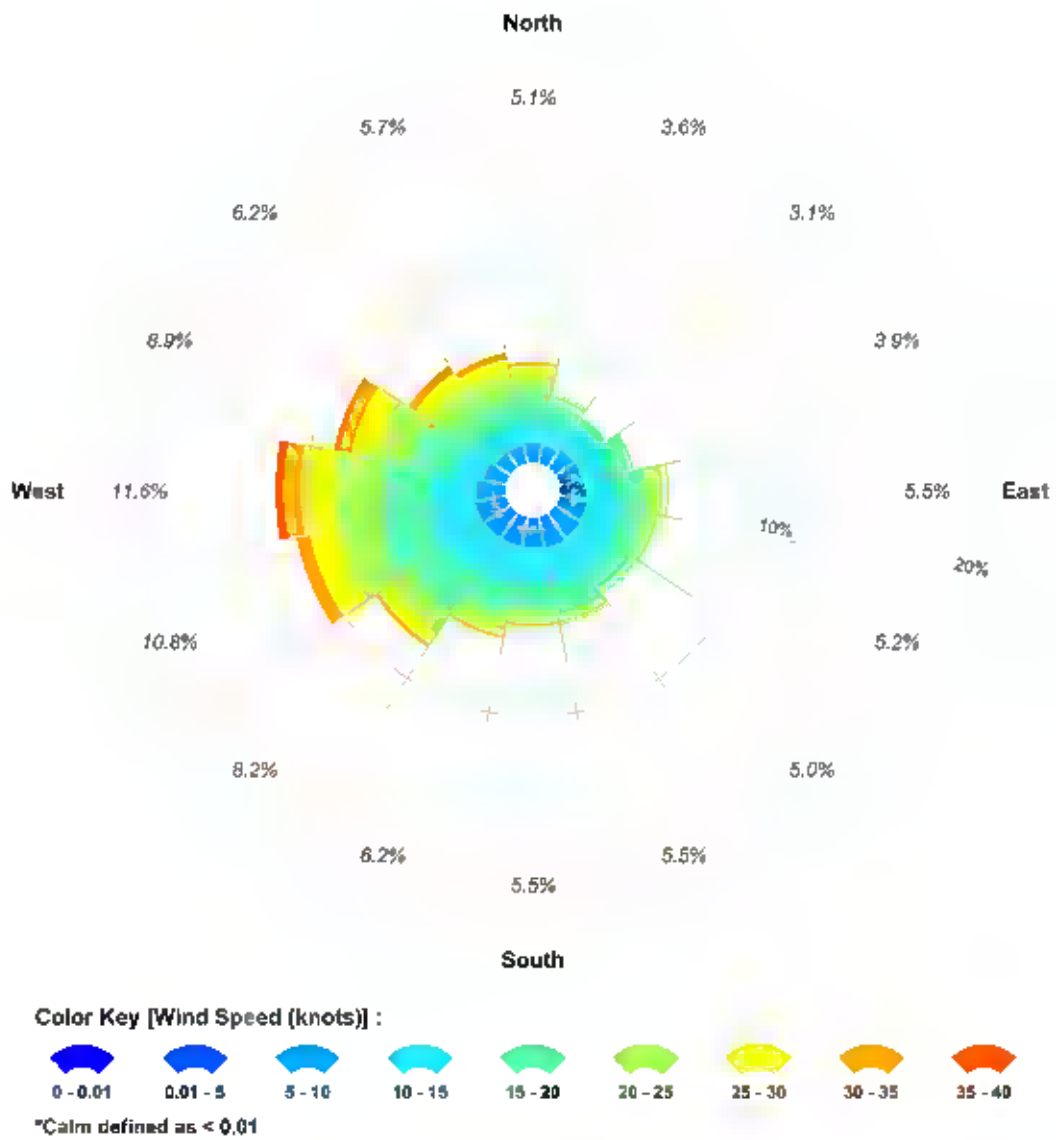


Figure 4.6 Total wind rose plots for Location 1. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.44°E, Latitude = 38.72°S
 Analysis Period: 01-Jan-2010 to 31-Dec-2019

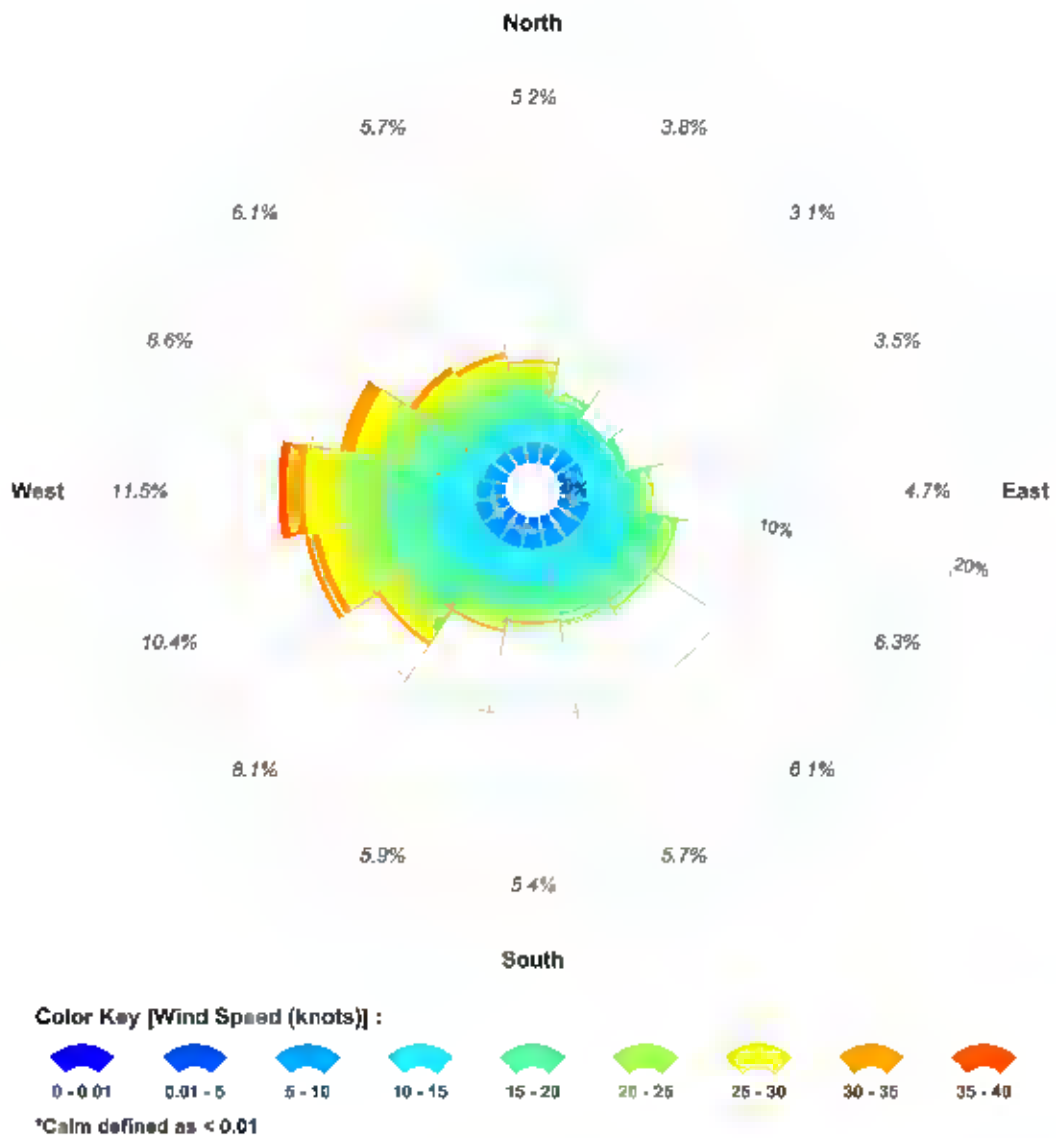


Figure 4.7 Total wind rose plots for Location 2. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.09°E, Latitude = 38.67°S

Analysis Period: 01-Jan-2010 to 31-Dec-2019

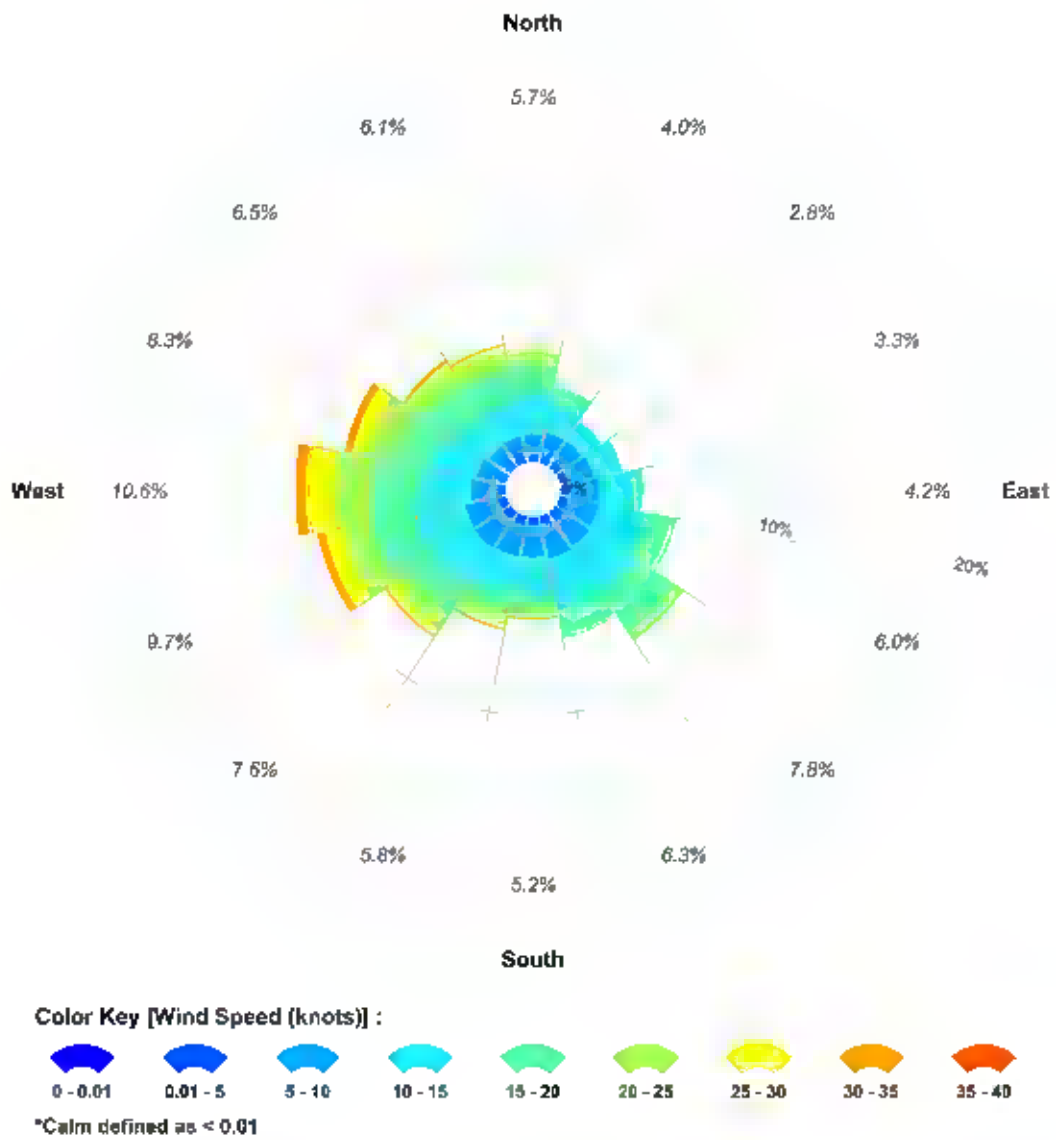


Figure 4.8 Total wind rose plots for Location 3. Data is based on modelled conditions between 2010–2019 (inclusive).

RPS Data Set Analysis

Wind Speed (knots) and Direction Rose (All Records)

Longitude = 142.13°E, Latitude = 38.50°S
 Analysis Period: 01-Jan-2010 to 31-Dec-2019

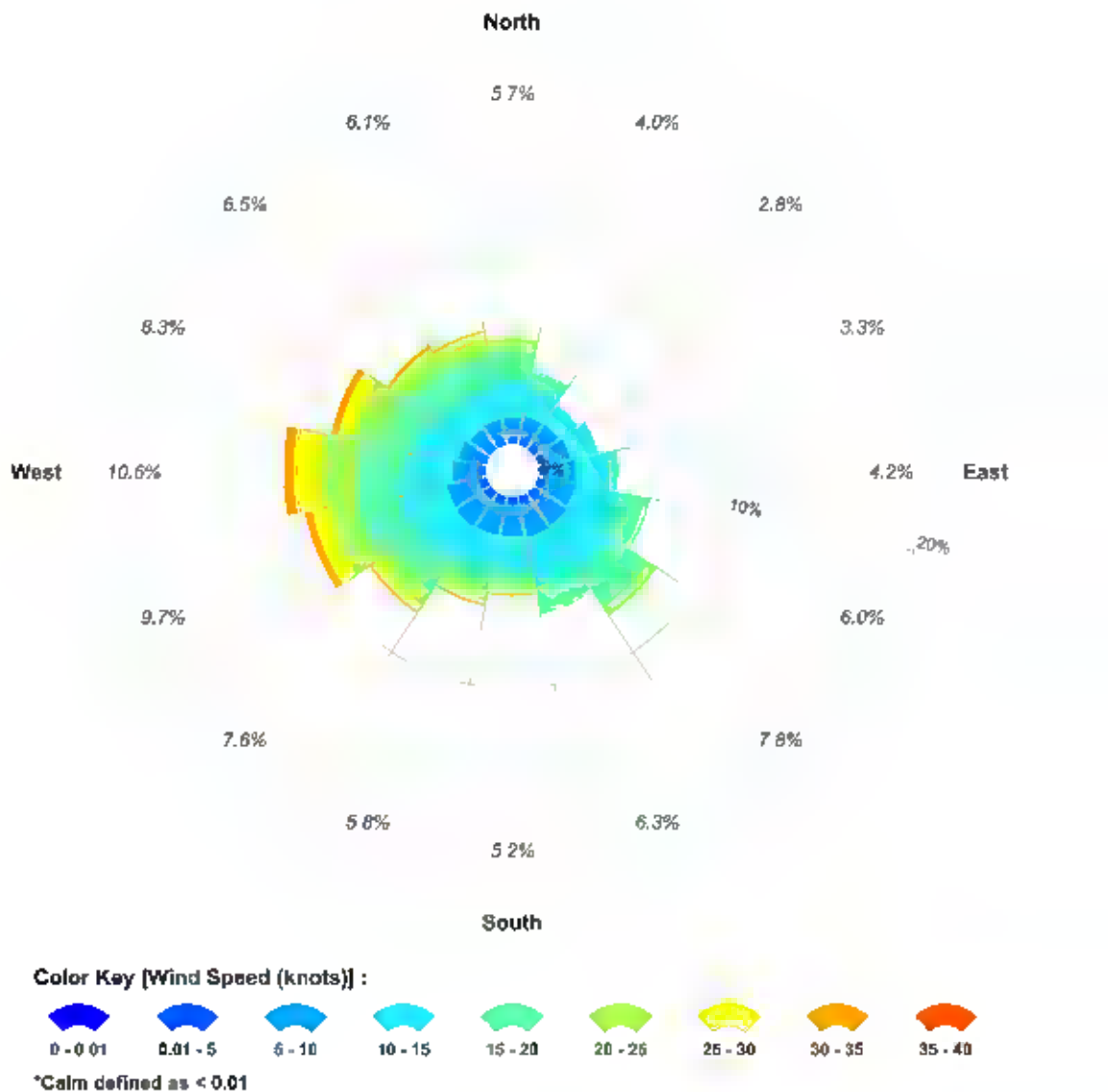


Figure 4.9 Total wind rose plots for Location 4. Data is based on modelled conditions between 2010–2019 (inclusive).

5 WATER TEMPERATURE AND SALINITY

Monthly water temperature and salinity data was obtained from the World Ocean Atlas 2013 database produced by the National Oceanographic Data Centre (National Oceanic and Atmospheric Administration) and its co-located World Data Center for Oceanography (Levitus et al. 2013). The data is used as input into oil spill model.

The monthly mean sea surface temperature and salinity values in the 0-5 m depth layer are presented in Table 5.1. The monthly average sea surface temperatures ranged between 13.2°C (September, release location 1) and 18.0°C (March, release locations 2, 3 and 4; and January, release location 2). The monthly average salinity values remain relatively consistent ranging between 35.1 psu and 35.6 psu.

Figure 5.1 and Figure 5.2 present the monthly water temperature and salinity profiles adjacent to release locations 1 and 2, and 3 and 4, respectively.

Table 5.1 Monthly average sea surface temperature and salinity adjacent to release locations 1–4.

Release Location		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Temperature (°C)	17.7	17.2	17.8	16.3	16.0	16.0	14.8	13.5	13.2	14.3	14.3	15.9
	Salinity (psu)	35.3	35.1	35.4	35.3	35.3	35.4	35.6	35.3	35.3	35.4	35.4	35.4
2	Temperature (°C)	18.0	17.5	18.0	16.5	16.6	16.1	14.8	14.0	13.4	14.3	14.5	16.0
	Salinity (psu)	35.4	35.2	35.5	35.4	35.4	35.4	35.5	35.3	35.3	35.3	35.4	35.3
3	Temperature (°C)	17.9	17.6	18.0	16.5	16.6	16.1	14.7	14.1	13.3	14.1	14.5	15.8
	Salinity (psu)	35.4	35.2	35.5	35.4	35.4	35.4	35.5	35.3	35.2	35.3	35.4	35.2
4	Temperature (°C)	17.9	17.6	18.0	16.5	16.6	16.1	14.7	14.1	13.3	14.1	14.5	15.8
	Salinity (psu)	35.4	35.2	35.5	35.4	35.4	35.4	35.5	35.3	35.2	35.3	35.4	35.2

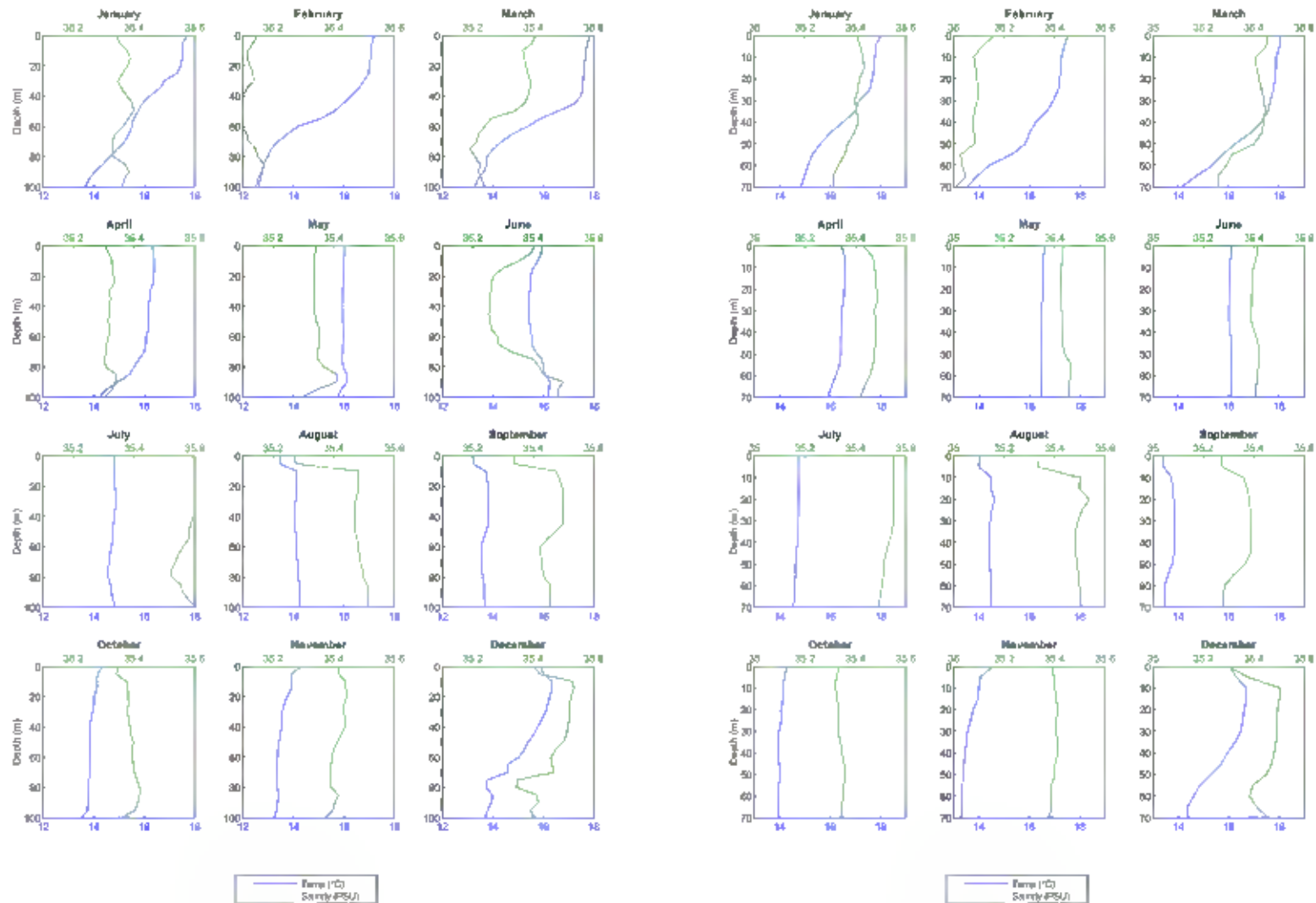


Figure 5.1 Monthly water temperature (blue line) and salinity (green line) profiles for Location 1 (left) and Location 2 (right). Depth of 0 m is the water surface.

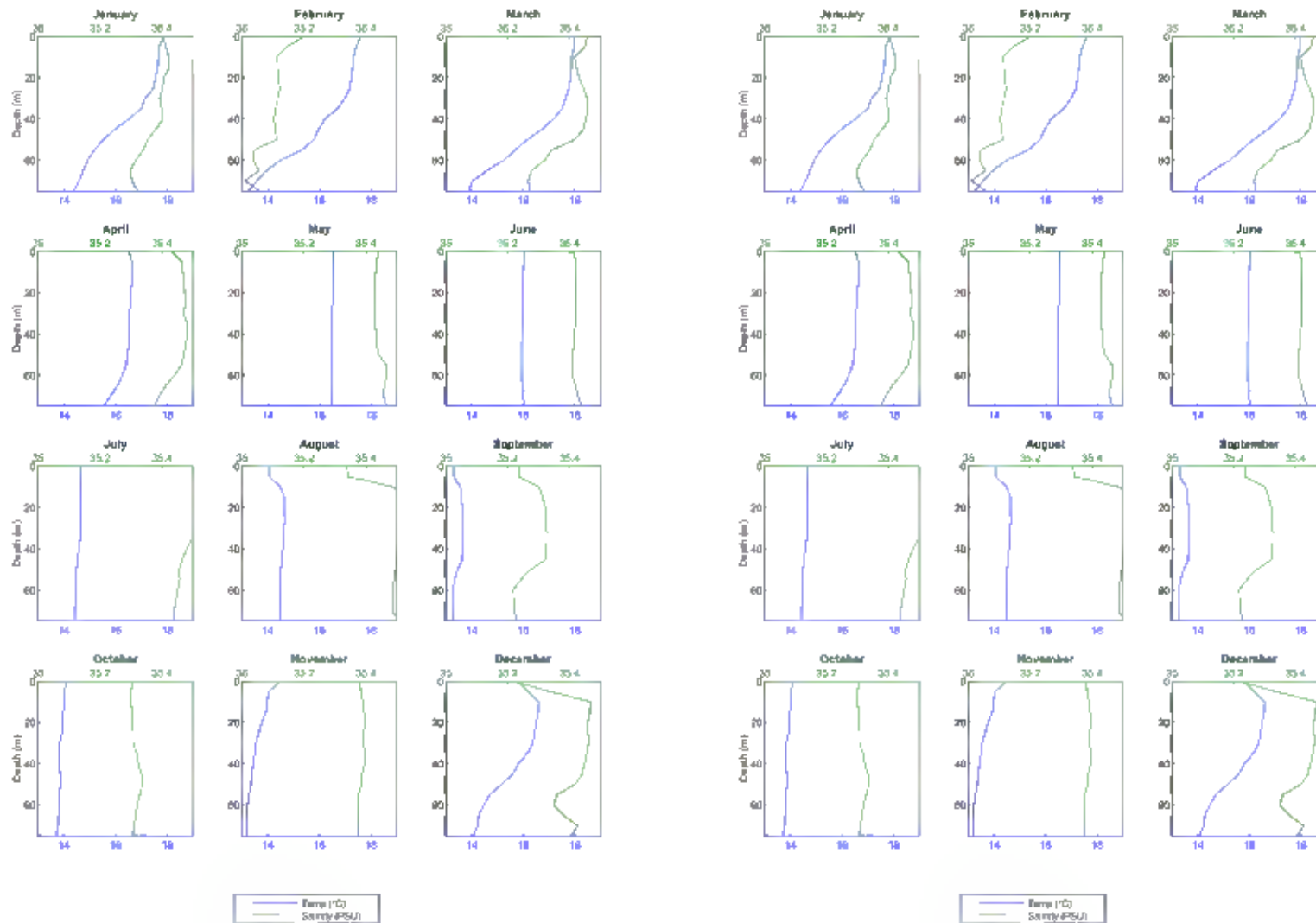


Figure 5.2 Monthly water temperature (blue line) and salinity (green line) profiles for Location 3 (left) and Location 4 (right). Depth of 0 m is the water surface.

6 NEAR-FIELD MODEL – OILMAP DEEP

The LOWC scenario is a high-pressure release of mostly gas, condensate and small volume of condensed water. Where gas is released with condensate, the buoyancy of the expanding gas cloud will entrain ambient seawater and propel the droplets towards the surface at a faster rate than would occur from the relative buoyancy of the oil alone. Furthermore, the turbulence generated by such an intense discharge will tend to break the condensate up into droplets of various sizes.

To define the near-field plume dynamics, the subsea blowout model, OILMAP-DEEP, was applied. The model simulates the plume rise dynamics in two phases, the initial jet phase and the buoyant plume phase. The initial jet phase governs the plume dynamics directly above the subsurface release location and is predominately driven by the exit velocity. During this phase, the hydrocarbon droplet size and distribution is calculated. Next, the rise dynamics are dominated by the buoyant nature of the plume until the termination of the plume phase (known as the trapping depth). At this point, the results from OILMAP-DEEP (including plume trapping depth, plume diameter and droplet size distribution) are integrated into the far-field model SIMAP to simulate the rise and dispersion of the condensate droplets.

More details on the OILMAP-DEEP model, can be found in Spaulding et al. (2015). The model has been validated against observations from Deepwater Horizon as well as small and large-scale laboratory studies on subsurface oil releases (Brandvik et al., 2013, 2014; Belore, 2014; Spaulding et al., 2015; Li et al., 2017). Figure 6.1 illustrates the various stages of an example blowout plume.

Table 6.1 presents the input parameters for the OILMAP-DEEP model and key results related to the near-field plume dynamics. Inputs to the model included specification of the condensate density, viscosity and the discharge rate of the fluids: the diameter of the exit hole and the gas to oil ratio. The local temperature and salinity profiles of the water column were also specified to define the vertical density profile.

The subsea near-field modelling indicated that this pressurised discharge would cause the plume to breach the surface waters and the condensate droplets would surface in less than a few minutes. The condensate droplets sizes were near identical at the four locations and range from 34 µm to 153 µm.

Table 6.1 Input data for the near field subsea modelling and key results for each location from the high-pressure LOWC release.

Input Variable	Location 1	Location 2	Location 3	Location 4
Water depth (m)	93	74	66	45
Exit hole diameter (inch)		8.53		
Condensate release rate (m ³ /day)		1,549		
Gas to condensate ratio (scf/bbl)		50,000		
Formation water flow rate (stb/day)		974		
Reservoir Temperature (°C)		130		
Well pressure at seafloor (psia)	136 psia (day 1) constant pressure	108 psia (day 1) constant pressure	96 psia (day 1) constant pressure	65 psia (day 1) constant pressure
Key results				
Plume execution depth (m BMSL)		0 (breach surface waters)		
Droplet sizes (µm)	35 - 153	34 - 148	34 - 149	34 - 146
Final plume diameter (m)	14.6	10.3	10.7	8.3

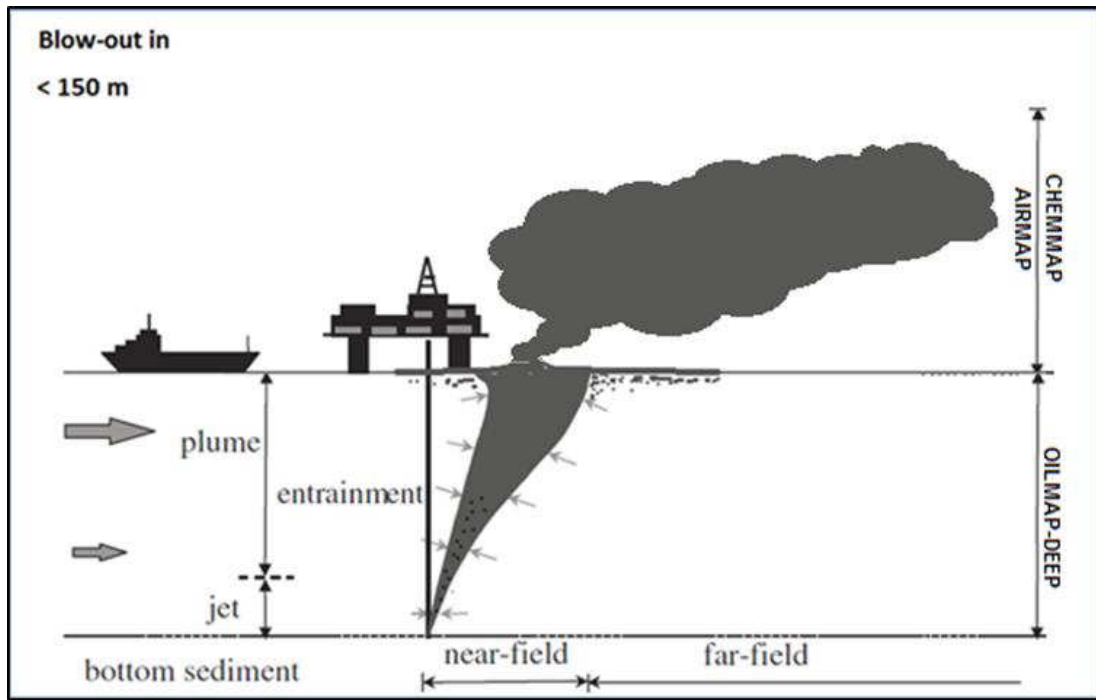


Figure 6.1 Example of a blowout plume illustrating the various stages of the plume in the water column (Source: Applied Science Associates, 2011).

7 OIL SPILL MODEL - SIMAP

The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP (Spill Impact Model Application Package). This model is designed to simulate the transport and weathering processes that affect the outcomes of hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns.

SIMAP is the evolution of the United States Environmental Protection Agency (US EPA) Natural Resource Damage Assessment model (French & Rines, 1997; French et al., 1999) and is designed to simulate the fate and effects of spilled oils and fuels for both the surface slick and the three-dimensional plume that is generated in the water column. SIMAP includes algorithms to account for both physical transport and weathering processes. The latter are important for accounting for the partitioning of the spilled mass over time between the water surface (surface slick), water column (entrained oil and dissolved compounds), atmosphere (evaporated compounds) and land (stranded oil). The model also accounts for the interaction between weathering and transport processes.

The physical algorithms calculate transport and spreading by physical forces, including surface tension, gravity and wind and current forces for both surface slicks and oil within the water column. The fates algorithms calculate all the weathering processes known to be important for oil spilled to marine waters. These include droplet and slick formation, entrainment by wave action, emulsification, dissolution of soluble components, sedimentation, evaporation, bacterial and photo-chemical decay and shoreline interactions. These algorithms account for the specific oil type being considered.

Entrainment is the physical process where globules of oil are transported from the sea surface into the water column by wind and wave-induced turbulence or be generated subsea by a pressurised discharge at depth. It has been observed that entrained oil is broken into droplets of varying sizes. Small droplets spread and diffuse into the water column, while larger ones rise rapidly back to the surface (Delvigne & Sweeney, 1988; Delvigne, 1991).

Dissolution is the process by which soluble hydrocarbons enter the water from a surface slick or from entrained droplets. The lower molecular weight hydrocarbons tend to be both more volatile and more soluble than those of higher molecular weight.

The formation of water-in-oil emulsions, or mousse, which is termed 'emulsification', depends on oil composition and sea state. Emulsified oil can contain as much as 80% water in the form of micrometre-sized droplets dispersed within a continuous phase of oil (Daling & Brandvik, 1991; Bobra, 1991; Daling et al., 1997; Fingas, 1995).

Evaporation can result in the transfer of large proportions of spilled oil from the sea surface to the atmosphere, depending on the type of oil (Gundlach & Boehm, 1981).

Evaporation rates vary over space and time dependent on the prevailing sea temperatures, wind and current speeds, the surface area of the slick and entrained droplets that are exposed to the atmosphere as well as the state of weathering of the oil. Evaporation rates will decrease over time, depending on the calculated rate of loss of the more volatile compounds. By this process, the model can differentiate between the fates of different oil types.

Decay (degradation) of hydrocarbons may occur as the result of photolysis, which is a chemical process energised by ultraviolet light from the sun, and by biological breakdown, termed biodegradation. Many types of marine organisms ingest, metabolise and utilise oil as a carbon source, producing carbon dioxide and water as by-products.

Entrainment, dissolution and emulsification rates are correlated to wave energy, which is accounted for by estimating wave heights from the sustained wind speed, direction and fetch (i.e. distance downwind from land barriers) at different locations in the domain. Dissolution rates are dependent upon the proportion of soluble, short-chained hydrocarbon compounds, and the surface area at the oil/water interface of slicks. Dissolution rates are also strongly affected by the level of turbulence. For example, dissolution rates will be relatively high at the site of the release for a deep-sea discharge at high pressure.

The SIMAP weathering algorithms include terms to represent these dynamic processes. Technical descriptions of the algorithms used in SIMAP and validations against real spill events are provided in French (1998), French et al. (1999) and French-McCay (2004).

Input specifications for oil types include density, viscosity, pour-point, distillation curve (volume of oil distilled off versus temperature) and the aromatic/aliphatic component ratios within given boiling point ranges. The model calculates a distribution of the oil by mass into the following components:

- Surface-bound or floating oil;
- Entrained oil (non-dissolved oil droplets that are physically entrained by wave action);
- Dissolved hydrocarbons (principally the aromatic and short-chained aliphatic compounds);
- Evaporated hydrocarbons;
- Sedimented hydrocarbons; and
- Decayed hydrocarbons.

8 HYDROCARBON PROPERTIES

Table 8.1 and Table 8.2 summarise the physical properties and boiling point ranges for the condensate and MDO, respectively.

The characteristics for Thylacine condensate used as a proxy for the LOWC were based on a detailed assay. Thylacine condensate has an API of 44.3, a density of 805 kg/m³ (at 15°C) and a low viscosity value of 0.875 cP.

The volatile to semi-volatile components (boiling point (BP) < 265 °C), which represent approximately 83% of the whole condensate is likely to evaporate over the first day if exposed to the atmosphere at local temperatures, leaving the less volatile portion (16%) to progressively evaporate more slowly. Only 1% of the condensate is considered persistent.

Thylacine condensate is categorised as a Group I oil (non – persistent oil) according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges.

The heavier components (i.e low volatile portion) of the condensate will tend to entrain into the upper water column during the presence of moderate winds (> 10 knots) and can potentially remain entrained for as long as the winds persist. But can subsequently resurface when the winds ease, and waves abate.

The MDO has a density of 829.1 kg/m³ (API of 37.6) and a low pour point of -14°C. The low viscosity (4 cP) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation.

Generally, about 6.0% of the MDO mass should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 34.6% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54.4% should evaporate over several days (265°C < BP < 380°C). Approximately 5% (by mass) of MDO will not evaporate, though will decay slowly over time.

The oil is categorised as a group II oil (light-persistent) according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges.

It is important to note that some heavy components contained the condensate and MDO will have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) and breaking waves but can re-float to the surface if these energies abate.

Table 8.1 Physical properties for Thylacine condensate and MDO.

Characteristic	Thylacine condensate	Marine Diesel Oil (MDO)
Density (kg/m ³)	805 (at 15°C)	829.1 (at 25 °C)
API	44.3	37.6
Dynamic viscosity (cP)	9.95 (at 50°C)	4.0 (at 25 °C)
Hydrocarbon property category	Group I	Group II
Hydrocarbon property classification	Non-persistent oil	Light-persistent oil

Table 8.2 Boiling point ranges for Thylacine condensate and MDO.

Characteristics	Non-Persistent			Persistent
	Volatile (%)	Semi-volatile (%)	Low-volatility (%)	Residual (%)
Boiling point (°C)	<180	180-265	265-380	>380
Thylacine condensate	64.0	19.0	16.0	1.0
Marine diesel oil (MDO)	6.0	34.6	54.4	5.0

9 THRESHOLDS

The thresholds and their relationship to exposure for the sea surface, shoreline, and water column (entrained and dissolved hydrocarbons) are presented in Sections 9.1 to 9.3. Supporting justifications of the adopted thresholds applied during the study and additional context relating to the area of influence are also provided. It is important to note that the thresholds herein are based on NOPSEMA (2019).

9.1 Floating Oil Exposure

The modelling results can be presented to any levels; therefore, thresholds have been specified (based on scientific literature) to record floating oil exposure to the sea-surface at meaningful levels only, described in the following paragraphs.

The low threshold to assess the potential for floating oil exposure, was 1 g/m², which equates approximately to an average thickness of 1 µm, referred to as visible oil. Oil of this thickness is described as rainbow sheen in appearance, according to the Bonn Agreement Oil Appearance Code (Bonn Agreement, 2009; AMSA, 2014). Table 9.1 provides a description of the appearance in relation to exposure zone thresholds used to classify the zones of floating oil exposure. Figure 9.1 shows photographs highlighting the difference in appearance between a rainbow sheen and metallic sheen. The low threshold is considered below levels which would cause environmental harm and it is more indicative of the areas perceived to be affected due to its visibility on the sea surface and potential to trigger temporary closures of areas (i.e., fishing grounds) as a precautionary measure.

Ecological impact has been estimated to occur at 10 g/m², which equates to a film thickness of approximately 10 µm or 0.01 mm (French et al. 1996; French-McCay 2009) as this level of fresh oiling has been observed to mortally impact some birds through adhesion of oil to their feathers, exposing them to secondary effects such as hypothermia. The appearance of oil at this average thickness has been described as a metallic sheen (Bonn Agreement, 2009). Concentrations above 10 g/m² is also considered the lower actionable threshold, where oil may be thick enough for containment and recovery as well as dispersant treatment (AMSA, 2015).

Oil concentrations on the sea surface of 25 g/m² (or greater), would be harmful for all birds that have landed in an oil film due to potential contamination of their feathers, with secondary effects such as loss of temperature regulation and ingestion of oil through preening (Scholten et al., 1996; Koops et al., 2004). The appearance of oil at this thickness is also described as metallic sheen (Bonn Agreement, 2009). For this study the high exposure threshold was set to 50 g/m² and above based on NOPSEMA (2019). This threshold can also be used to inform response planning.

Table 9.2 defines the thresholds used to classify the zones of floating oil exposure reported herein.

Table 9.1 The Bonn Agreement Oil Appearance Code.

Code	Description Appearance	Layer Thickness Interval (g/m ² or µm)	Litres per km ²
1	Sheen (silvery/grey)	0.04 – 0.30	40 – 300
2	Rainbow	0.30 – 5.0	300 – 5,000
3	Metallic	5.0 – 50	5,000 – 50,000
4	Discontinuous True Oil Colour	50 – 200	50,000 – 200,000
5	Continuous True Oil Colour	≥ 200	≥ 200,000

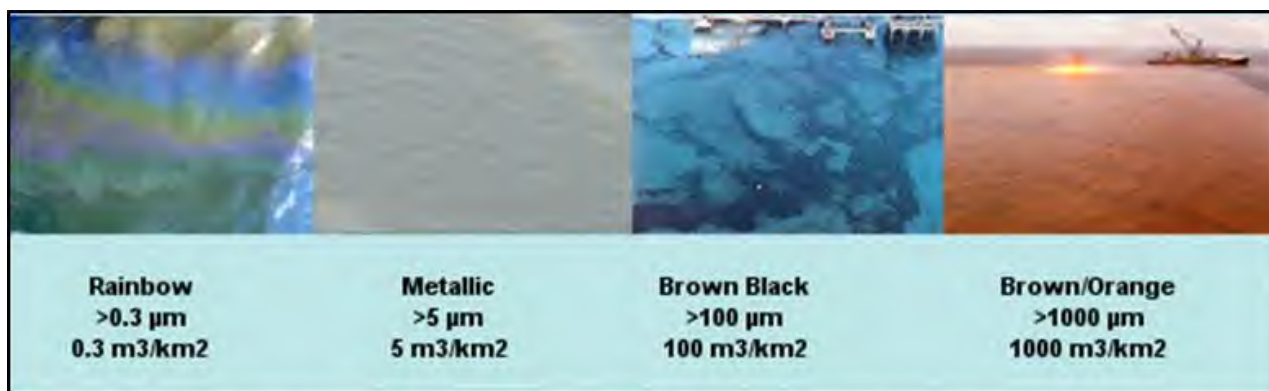


Figure 9.1 Photographs showing the difference between oil colour and thickness on the sea surface (source: adapted from Oil Spill Solutions, 2015).

Table 9.2 Floating oil exposure thresholds used in this report (in alignment with NOPSEMA (2019)).

Threshold level	Floating oil (g/m ²)	Description
Low	1	Approximates range of socio-economic effects and establishes planning area for scientific monitoring
Moderate	10	Approximates lower limit for harmful exposures to birds and marine mammals
High	50*	Approximates surface oil slick and informs response planning

* 50 g/m² also used to define the threshold for actionable floating oil.

9.2 Shoreline Accumulation

There are many different types of shorelines, ranging from cliffs, rocky beaches, sandy beaches, mud flats and mangroves, and each of these influences the volume of oil that can remain stranded ashore and its thickness before the shoreline saturation point occurs. For instance, a sandy beach may allow oil to percolate through the sand, thus increasing its ability to hold more oil ashore over tidal cycles and various wave actions than an equivalent area of water; hence oil can increase in thickness onshore over time. A sandy beach shoreline was assumed as the default shoreline type for the modelling in this study, as it allows for the highest carrying capacity of oil (of the available open/exposed shoreline types). Hence the results are considered conservative (i.e., worst-case) given that a large part of the shoreline in the study area (especially the western part of the Joseph Bonaparte Gulf) is characterised by exposed rocky shorelines, with southern parts characterised by tidal mudflats and mangroves and eastern shorelines containing more sandy beaches.

Previous risk assessment studies, French-McCay et al. (2005a; 2005b) used a threshold of 10 g/m² to assess the potential for shoreline accumulation. This is a conservative threshold used to define regions of socio-economic impact, such as triggering temporary closures of adjoining fisheries or the need for shore clean-up on beaches or man-made features/amenities (breakwaters, jetties, marinas, etc.). It would equate to approximately 2 teaspoons of hydrocarbon per square meter of shoreline accumulation. The appearance is described as a stain/film. On that basis, the 10 g/m² shoreline accumulation threshold has been selected to define the zone of potential “low shoreline accumulation”.

French et al. (1996) and French-McCay (2009) define a shoreline oil accumulation threshold of 100 g/m², or above, would potentially harm shorebirds and wildlife (fur-bearing aquatic mammals and marine reptiles on or along the shore) based on studies for sub-lethal and lethal impacts. This threshold has been used in previous environmental risk assessment studies (see French-McCay, 2003; French-McCay et al., 2004, French-McCay et al., 2011; 2012; NOAA, 2013). Additionally, a shoreline concentration of 100 g/m², or above, is the minimum concentration that the oil can be effectively cleaned according to AMSA (2015). This threshold equates to approximately ½ a cup of oil per square meter of shoreline accumulation. The

appearance is described as a thin oil coat. Therefore, 100 g/m² has been selected to define the zone of potential “moderate shoreline accumulation”.

Observations by Lin & Mendelsohn (1996) demonstrated that loadings of more than 1,000 g/m² of hydrocarbon during the growing season would be required to impact marsh plants significantly. Similar thresholds have been found in studies assessing hydrocarbon impacts on mangroves (Grant et al., 1993; Suprayogi & Murray, 1999). This loading equates to approximately 1 litre of hydrocarbon per square meter of shoreline accumulation and the appearance is described as a hydrocarbon cover. A loading of 1,000 g/m² has been selected to define the zone of potential “high shoreline accumulation”.

These shoreline accumulation thresholds derived from extensive literature review (outlined in Table 9.3) align with the threshold values for oil spill modelling specified in NOPSEMA (2019).

Table 9.3 Thresholds used to assess shoreline accumulation.

Threshold level	Shoreline loading (g/m ²)	Description
Low (socioeconomic/sublethal)	10	Predicts potential for some socio-economic impact
Moderate	100*	Loading predicts area likely to require clean-up effort
High	1,000	Loading predicts area likely to require intensive clean-up effort

* 100 g/m² also used to define the threshold for actionable shoreline oil.

9.3 In-water Exposure

Oil is a mixture of thousands of hydrocarbons of varying physical, chemical, and toxicological characteristics, and therefore, demonstrate varying fates and impacts on organisms. As such, for in-water exposure, the SIMAP model provides separate outputs for dissolved and entrained hydrocarbons from oil droplets. The consequences of exposure to dissolved and entrained components will differ because they have different modes and magnitudes of effect.

Entrained hydrocarbon concentrations were calculated based on oil droplets that are suspended in the water column, though not dissolved. The composition of this oil would vary with the state of weathering (oil age) and may contain soluble hydrocarbons when the oil is fresh. Calculations for dissolved hydrocarbons specifically calculates oil components which are dissolved in water, which are known to be the primary source of toxicity exerted by oil.

A complicating factor that should be considered when assessing the consequence of dissolved and entrained oil distributions is that there will be some areas where both physically entrained oil droplets and dissolved hydrocarbons co-exist. Higher concentrations of each will tend to occur close to the source where sea conditions can force mixing of relatively unweathered oil into the water column, resulting in more rapid dissolution of soluble compounds.

9.3.1 Dissolved Hydrocarbons

Laboratory studies have shown that dissolved hydrocarbons exert most of the toxic effects of oil on aquatic biota (Carls et al., 2008; Nordtug et al., 2011; Redman, 2015). The mode of action is a narcotic effect, which is positively related to the concentration of soluble hydrocarbons in the body tissues of organisms (French-McCay, 2002). Dissolved hydrocarbons are taken up by organisms directly from the water column by absorption through external surfaces and gills, as well as through the digestive tract. Thus, soluble hydrocarbons are termed “bioavailable”.

Hydrocarbon compounds vary in water-solubility and the toxicity exerted by individual compounds is inversely related to solubility, however bioavailability will be modified by the volatility of individual compounds (Nirmalakhandan & Speece, 1988; Blum & Speece, 1990; McCarty, 1986; McCarty et al., 1992a, 1992b;

McCarty & Mackay, 1993; Verhaar et al., 1992, 1999; Swartz et al., 1995; French-McCay, 2002; McGrath and Di Toro, 2009). Of the soluble compounds, the greatest contributor to toxicity for water-column and benthic organisms are the lower-molecular-weight aromatic compounds, which are both volatile and soluble in water. Although they are not the most water-soluble hydrocarbons within most oil types, the polynuclear aromatic hydrocarbons (PAHs) containing 2-3 aromatic ring structures typically exert the largest narcotic effects because they are semi-soluble and not highly volatile, so they persist in the environment long enough for significant accumulation to occur (Anderson et al., 1974, 1987; Neff & Anderson, 1981; Malins & Hodgins, 1981; McAuliffe, 1987; NRC, 2003). The monoaromatic hydrocarbons (MAHs), including the BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), and the soluble alkanes (straight chain hydrocarbons) also contribute to toxicity, but these compounds are highly volatile, so that their contribution will be low when oil is exposed to evaporation and higher when oil is discharged at depth where volatilisation does not occur (French-McCay, 2002).

French-McCay (2002) reviewed available toxicity data, where marine biota was exposed to dissolved hydrocarbons prepared from oil mixtures, finding that 95% of species and life stages exhibited 50% population mortality (LC₅₀) between 6 and 400 ppb total PAH concentration after 96 hrs exposure, with an average of 50 ppb. Hence, concentrations lower than 6 ppb total PAH value should be protective of 97.5% of species and life stages even with exposure periods of days (at least 96 hours). Early life-history stages of fish appear to be more sensitive than older fish stages and invertebrates.

Exceedances of 10, 50 or 400 ppb over a 1 hour timestep (see Table 9.4) were applied in this study to indicate the increasing potential for sub-lethal to lethal toxic effects (or low to high), based on NOPSEMA (2019).

9.3.2 Entrained Hydrocarbons

Entrained hydrocarbons consist of oil droplets that are suspended in the water column and insoluble. Insoluble compounds in oil cannot be absorbed from the water column by aquatic organisms, therefore they are not bioavailable through absorption of compounds from the water. Exposure to these compounds would require routes of uptake other than absorption of soluble compounds. The route of exposure of organisms to whole oil alone include direct contact with tissues of organisms and uptake of oil by direct consumption, with potential for biomagnification through the food chain (NRC, 2003).

The 10 ppb threshold corresponds generally with the lowest trigger levels for chronic exposure for entrained hydrocarbons in the ANZECC & ARMCANZ (2000) water quality guidelines. Due to the requirement for relatively long exposure times (> 24 hours) for these concentrations to accumulate, they are likely to be more meaningful for juvenile fish, larvae and planktonic organisms that might be entrained (or otherwise moving) within the entrained plumes, or when entrained hydrocarbons adhere to organisms or are trapped against a shoreline for periods of several days or more.

This exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill. This area does not define the area of influence as it is considered that the environment will not be affected by the entrained hydrocarbon at this level.

Thresholds of 10 ppb and 100 ppb were applied over a 1 hour time exposure (Table 9.4), to cover the range of thresholds outlined in ANZECC & ARMCANZ (2000) water quality guidelines and is per NOPSEMA (2019).

Table 9.4 Dissolved and entrained hydrocarbon exposure values assessed over a 1-hour time step, as per NOPSEMA (2019).

	Exposure level	In-water threshold (ppb)	Description
Dissolved hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	Moderate	50	Approximates potential toxic effects, particularly sublethal effects to sensitive species
	High	400	Approximates toxic effects including lethal effects to sensitive species
Entrained hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	High	100	As appropriate given oil characteristics for informing risk evaluation

9.4 Dispersion

A horizontal dispersion coefficient of 10 m²/s was used to account for dispersive processes acting at the surface that are below the scale of resolution of the input current field, based on typical values for open waters (Okubo, 1971). Dispersion rates within the water column (applicable for entrained and dissolved plumes of hydrocarbons) were specified at 1 m²/s, based on empirical data for the dispersion of hydrocarbon plumes (King & McAllister, 1998).

10 RECEPTORS

A range of environmental receptors and shorelines were assessed for floating oil exposure, shoreline contact and water column exposure (entrained and dissolved hydrocarbons) as part of the study (see Figure 10.1 to Figure 10.12). Receptor categories are shown in Table 10.1 which includes coastal and offshore islands grouped as shorelines. All other sensitive receptors other than submerged reefs, shoals and banks (RSB) were sourced from Australian Government Department of Agriculture, Water and the Environment (<http://www.environment.gov.au/>). Probabilities of exposure were separately calculated for each sensitive receptor area and have been tabulated.

Table 10.1 Summary of receptors assessed for potential oil exposure.

Receptor Category	Acronym	Hydrocarbon Exposure and Accumulation Assessment		
		Floating oil	Water Column	Shoreline
Australian Marine Park	AMP	✓	✓	✗
Biologically Important Area	BIA	✓	✓	✗
Conservation Park	CP	✓	✓	✗
Interim Biogeographic Regionalisation for Australia bioregions	IBRA	✓	✓	✗
Integrated marine and coastal regionalisation areas	IMCRA	✓	✓	✗
Marine National Park	MNP	✓	✓	✗
Marine Park	MP	✓	✓	✗
Marine Sanctuary	MS	✓	✓	✗
National Park	NP	✓	✓	✗
National Parks Act Schedule 4 park or reserve	NPS4	✓	✓	✗
Nature Reserve	NR	✓	✓	✗
Ramsar Sites	Ramsar	✓	✓	✗
Reefs, Shoals and Banks	RSB	✓	✓	✗
Key Ecological Feature	KEF	✓	✓	✗
State Waters	State Waters	✓	✓	✗
Shorelines	Shore	✓ (Reported as: Nearshore Waters)	✓ (Reported as: Nearshore Waters)	✓

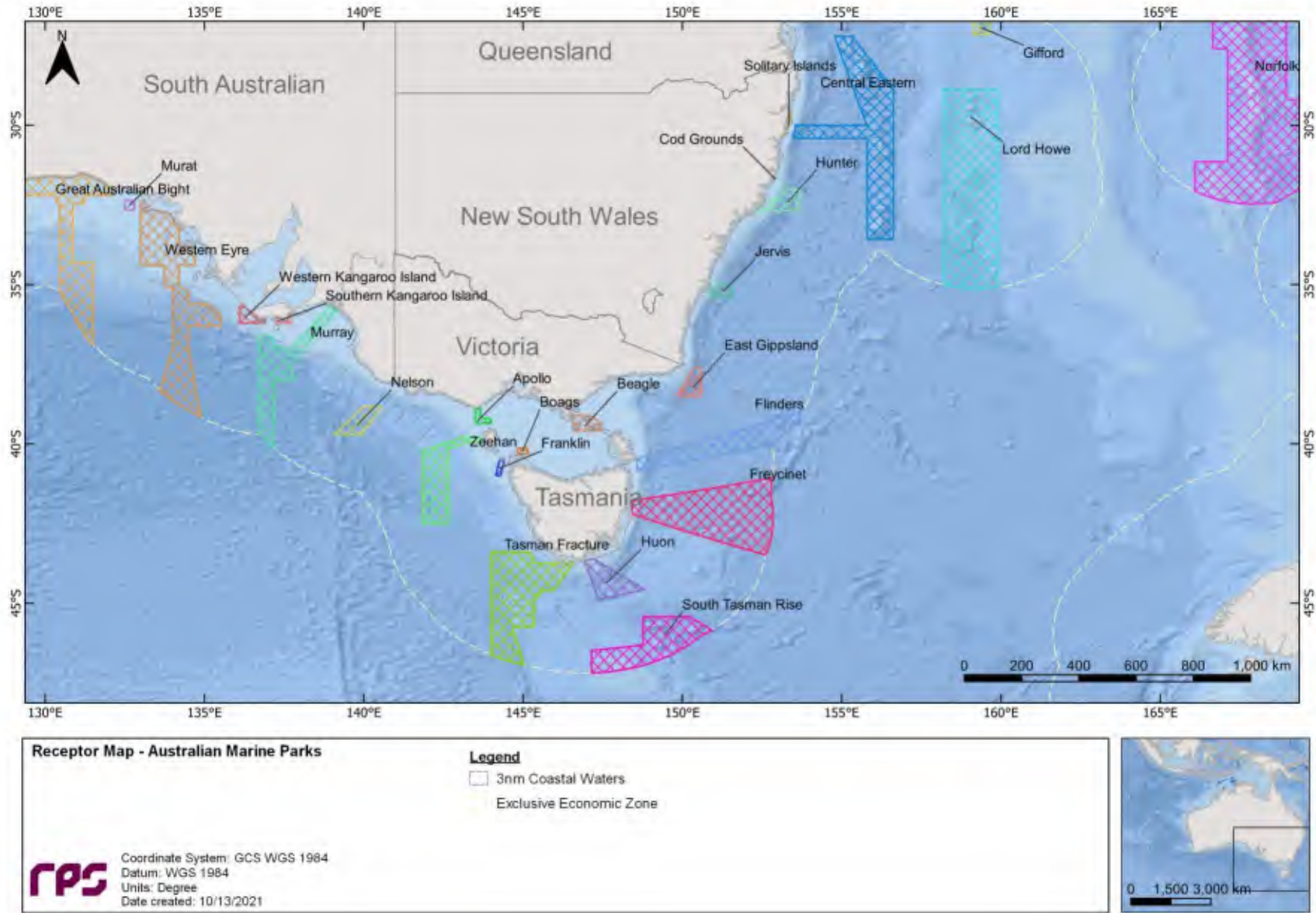


Figure 10.1 Receptor map for Australian Marine Parks (AMP).

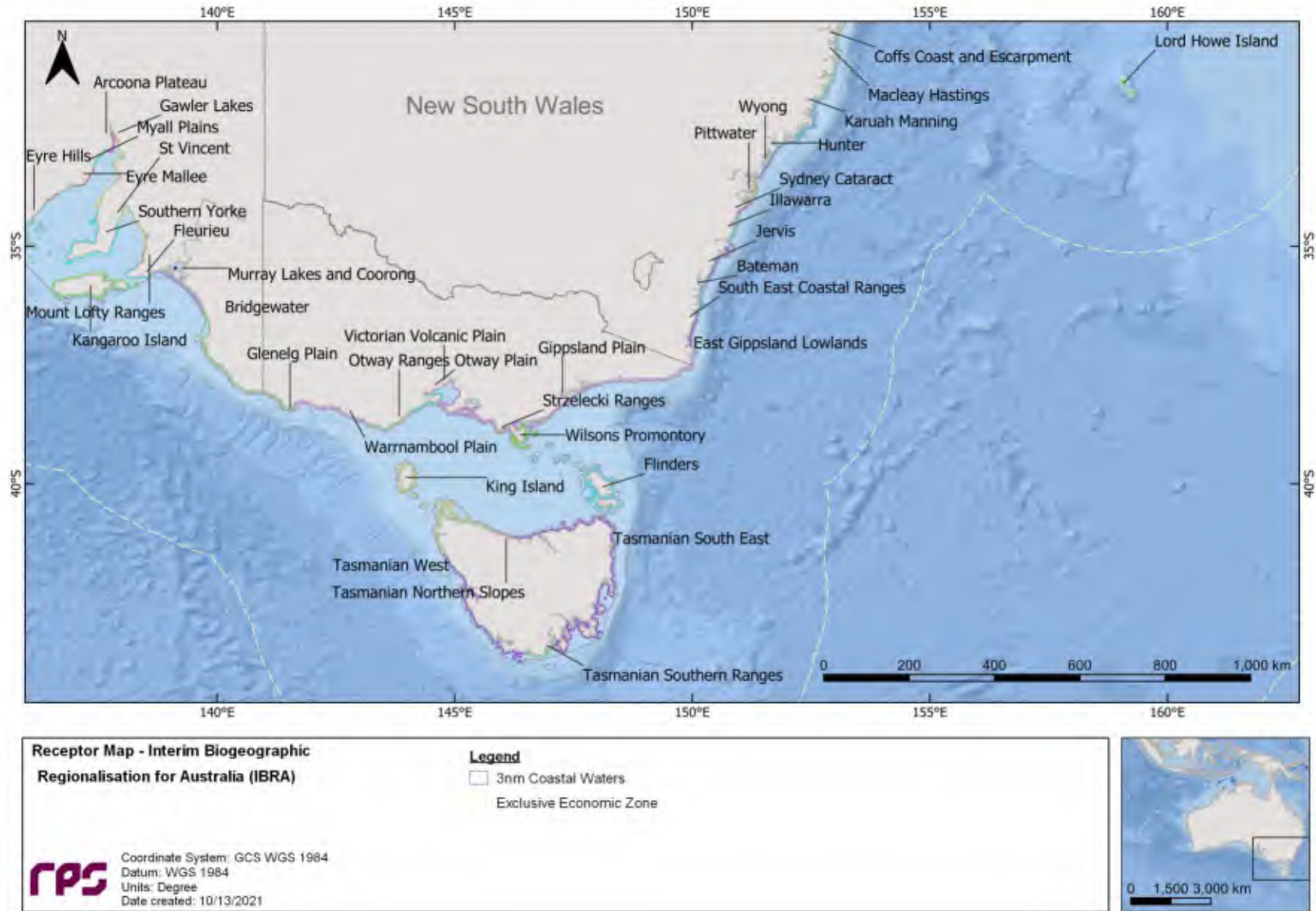


Figure 10.2 Receptor map for the Interim Biogeographic Regionalisation for Australia (IBRA) bioregions.

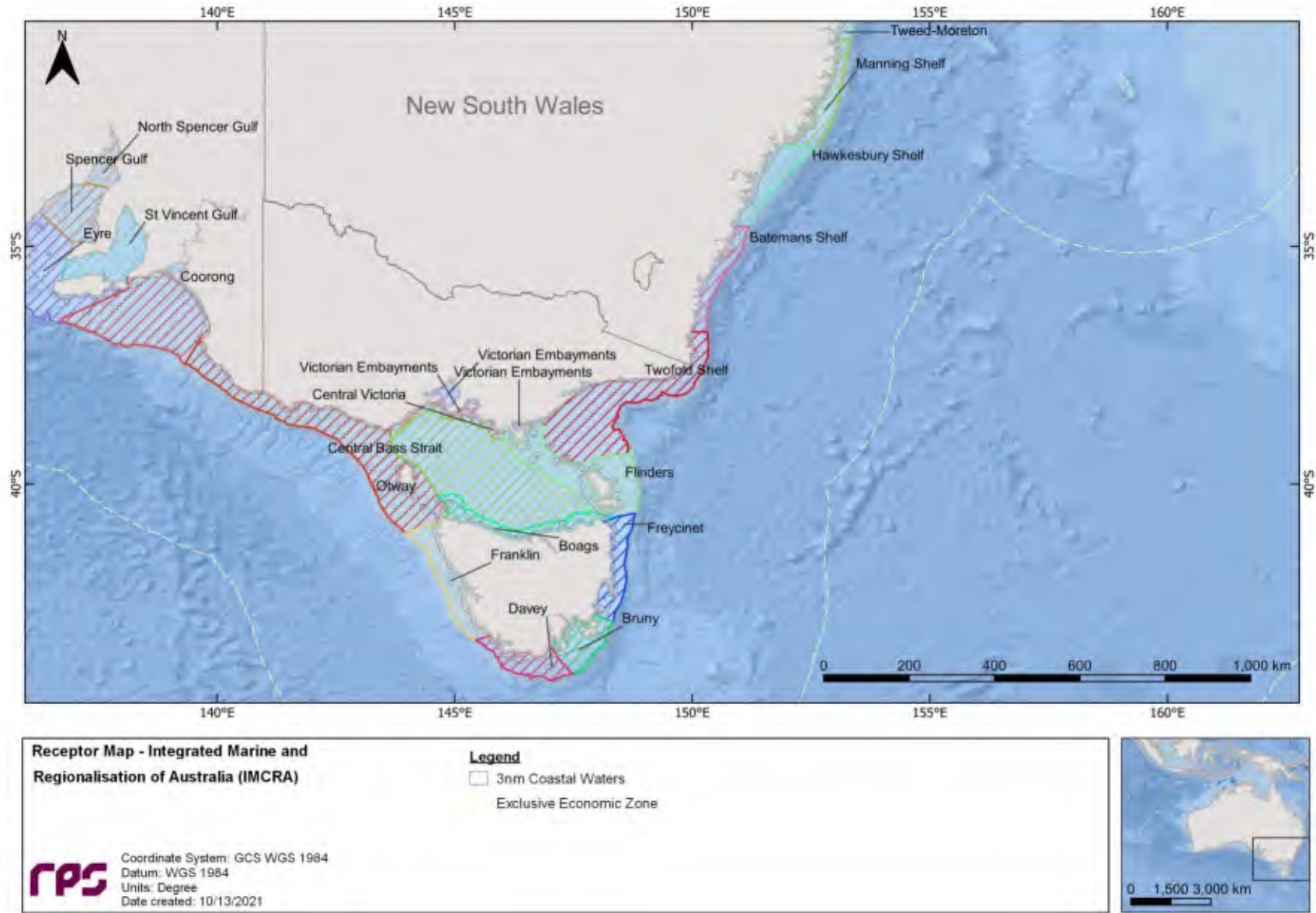


Figure 10.3 Receptor map for integrated marine and coastal regionalisation (IMCRA) areas.

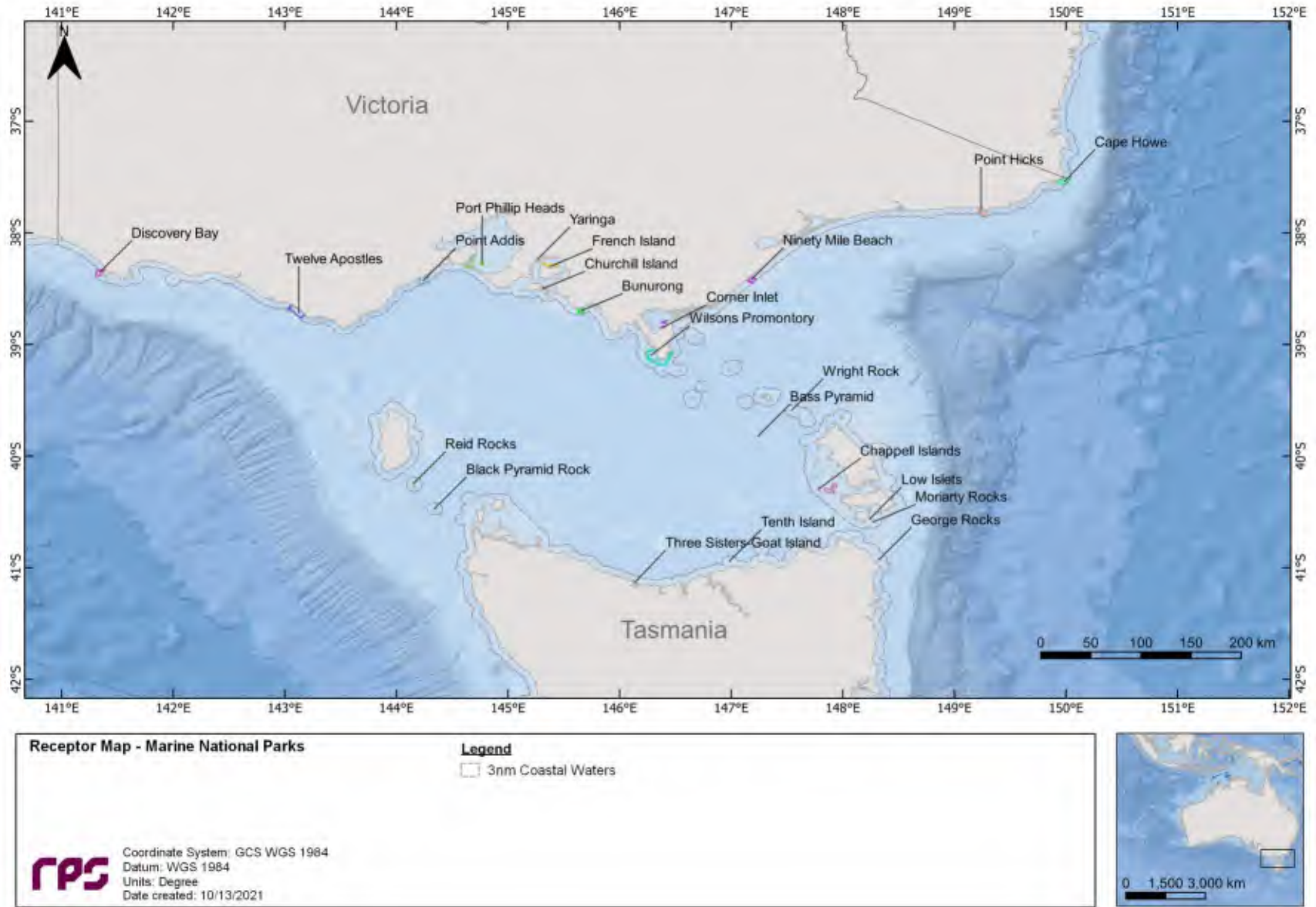


Figure 10.4 Receptor map for Marine National Parks (MNP).

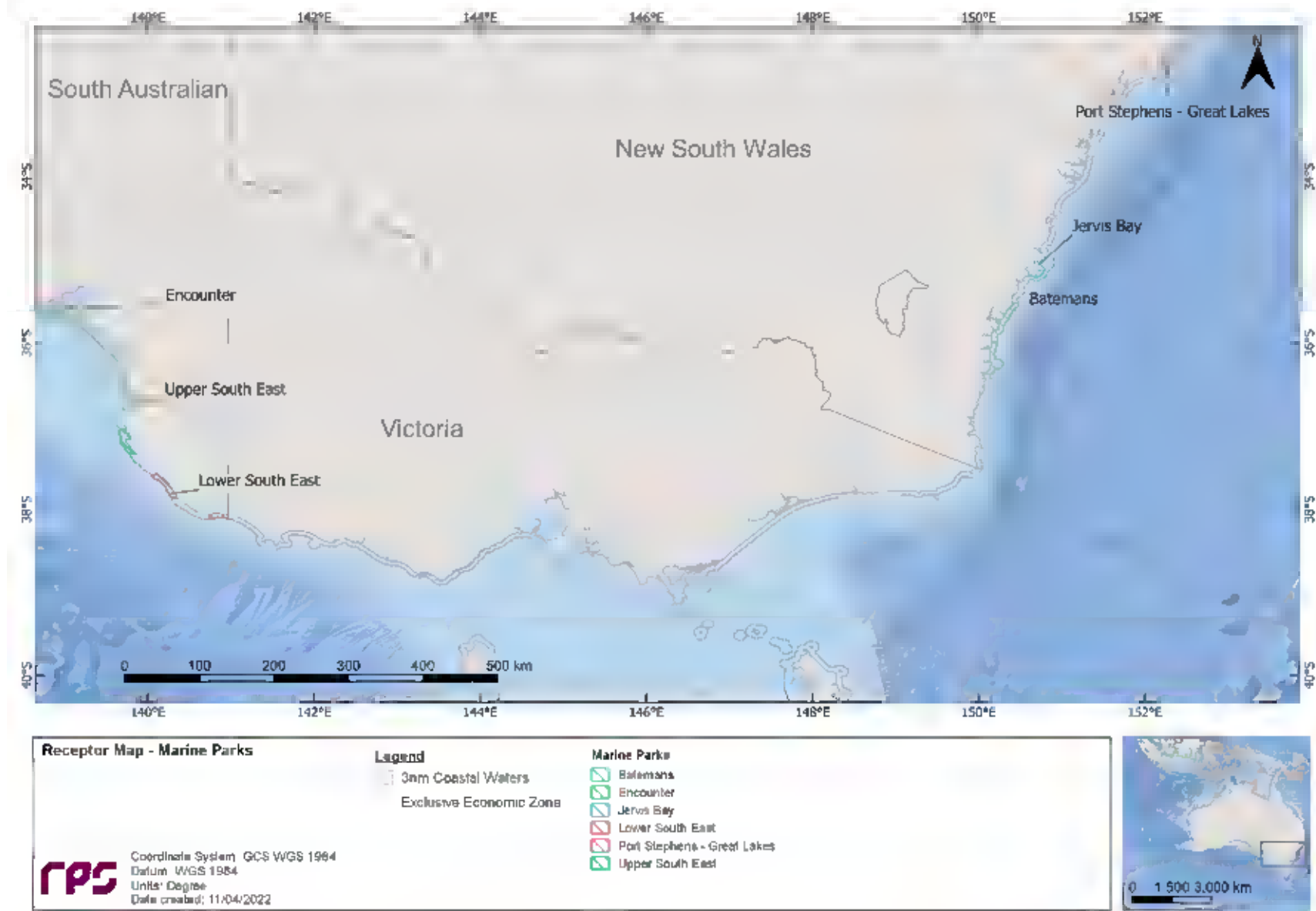


Figure 10.5 Receptor map for Marine Parks (MP).

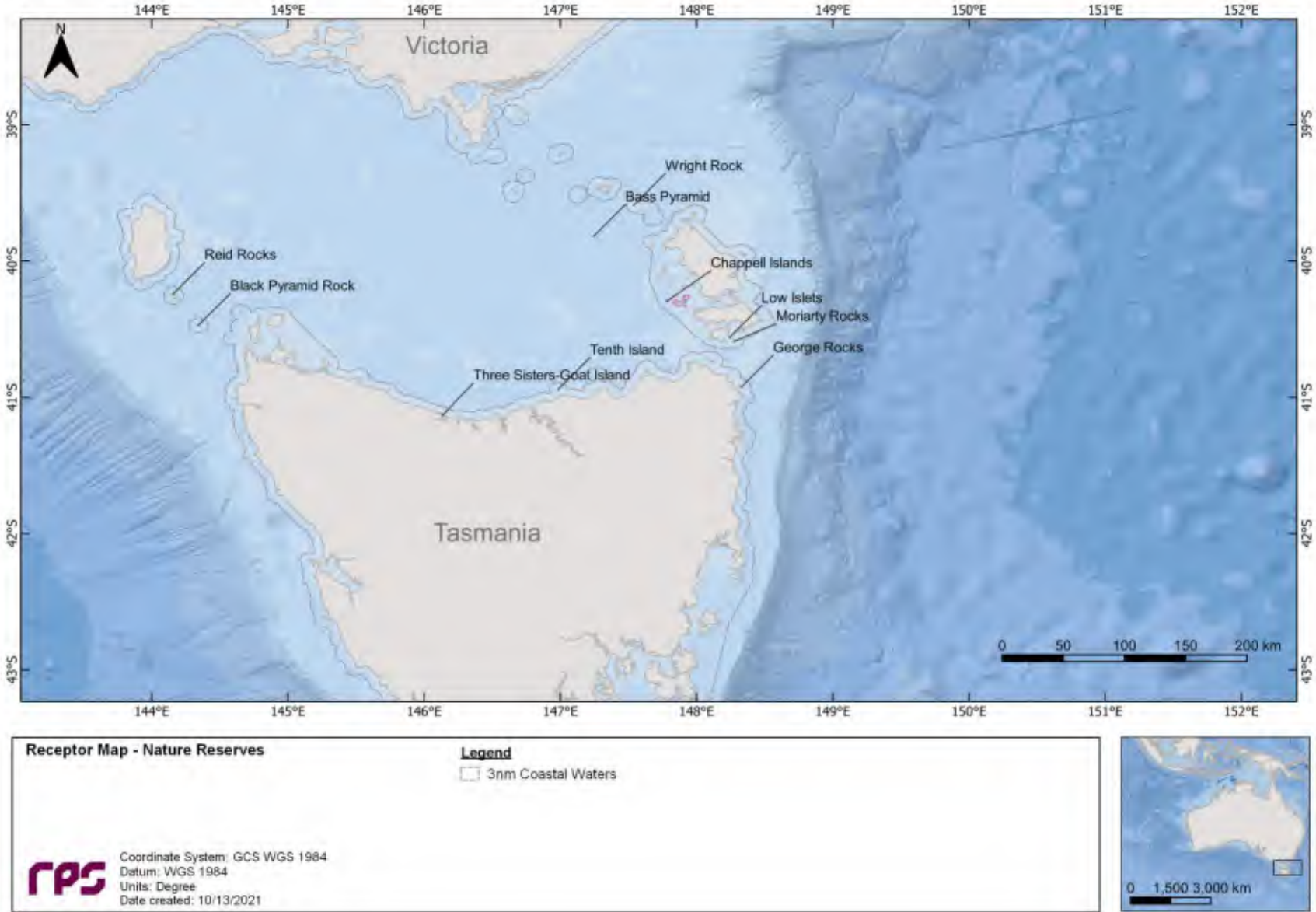


Figure 10.6 Receptor map for Nature Reserves (NR).

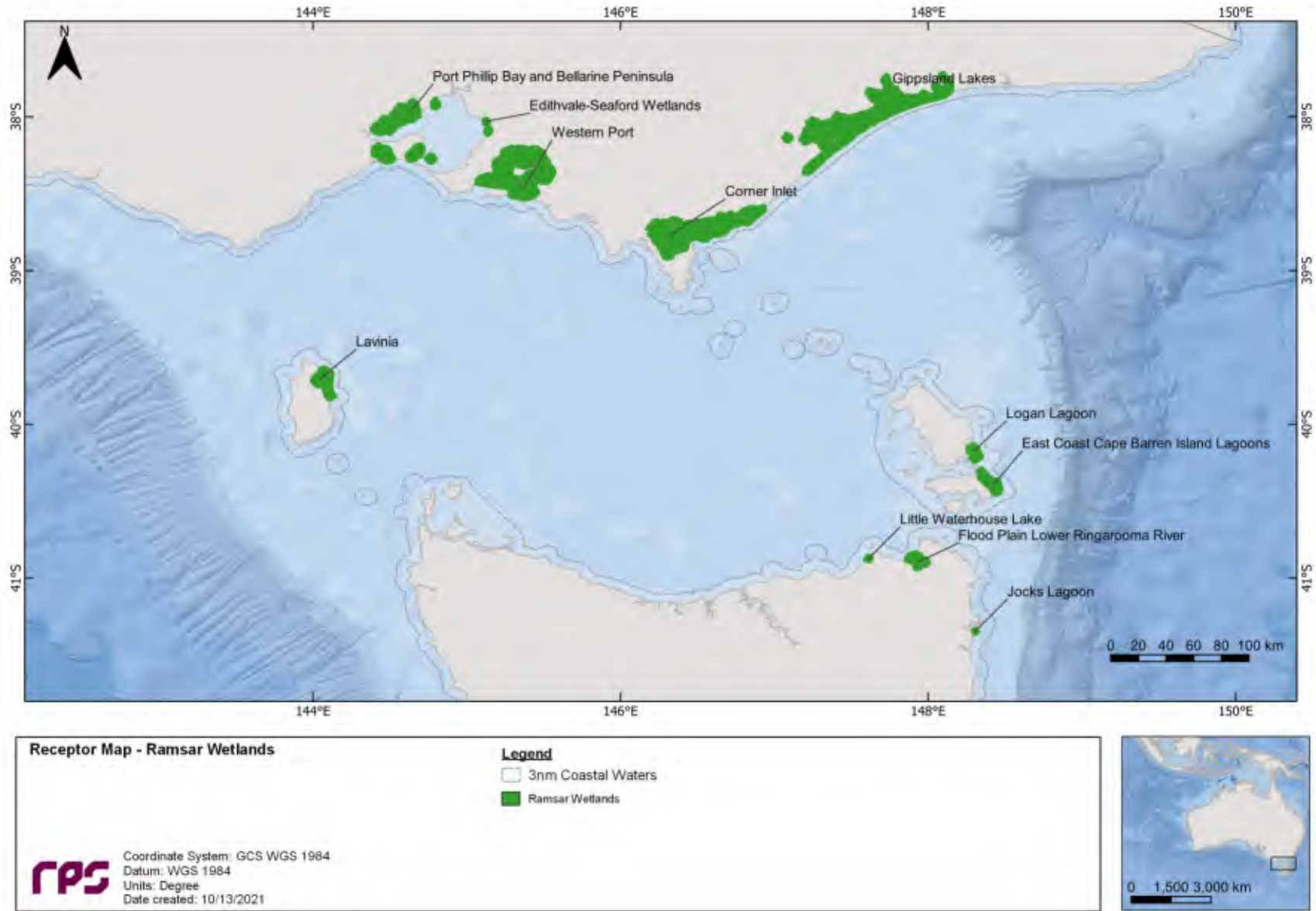


Figure 10.7 Receptor map for Ramsar Sites (Ramsar).

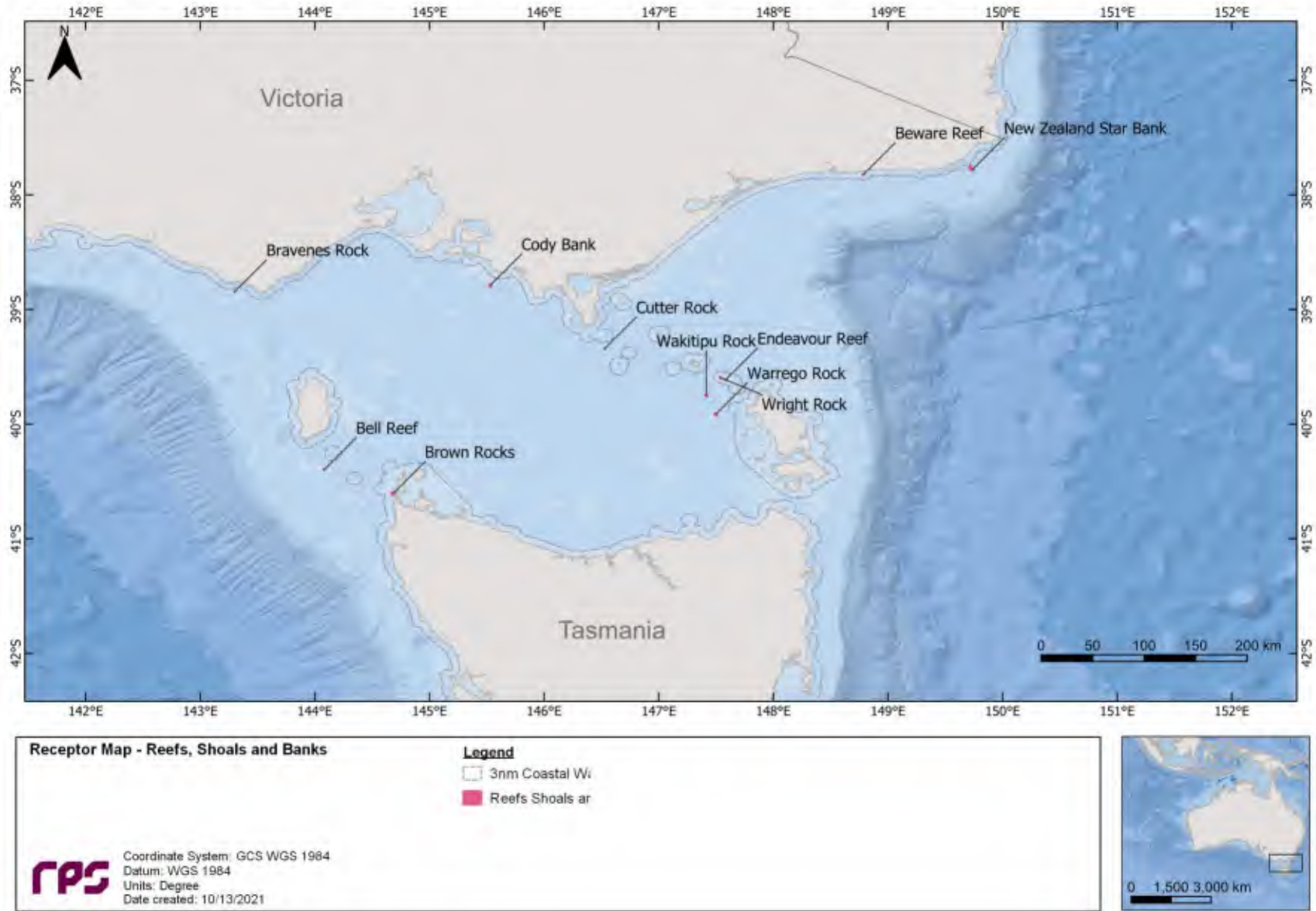


Figure 10.8 Receptor map for Reefs, Shoals and Banks (RSB).

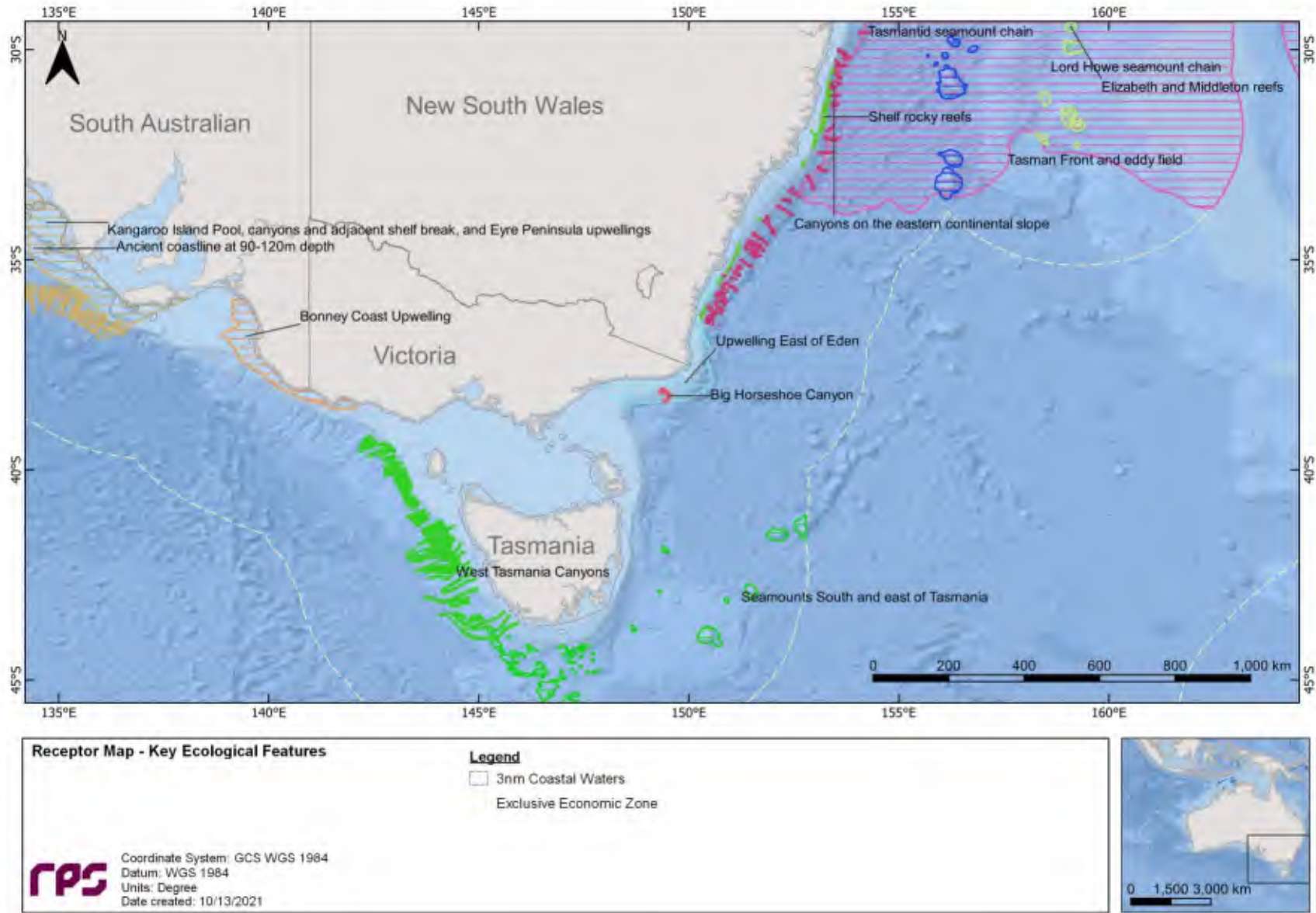


Figure 10.9 Receptor map for Key Ecological Features (KEF).

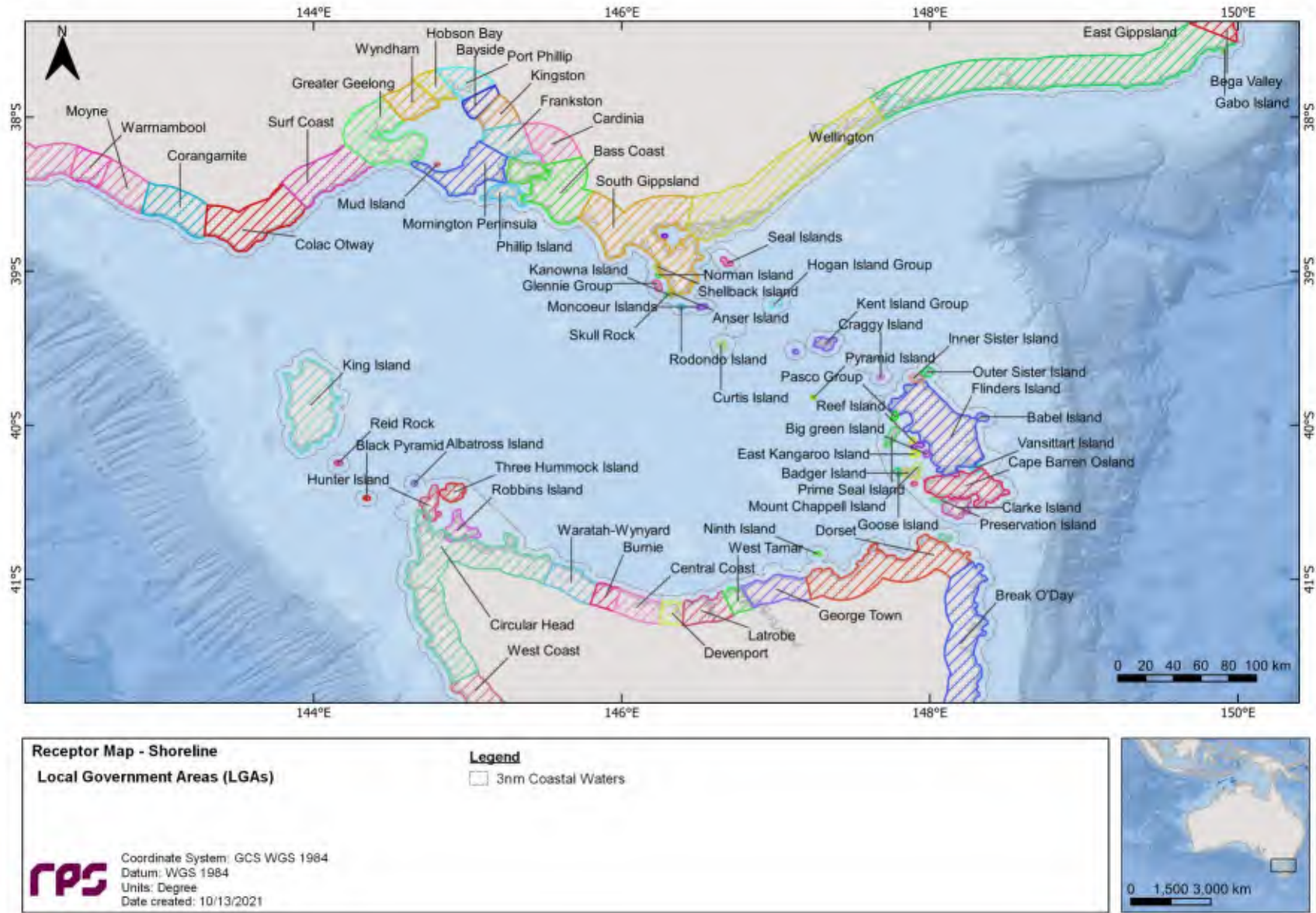


Figure 10.10 Receptor map for shorelines (1 of 3).

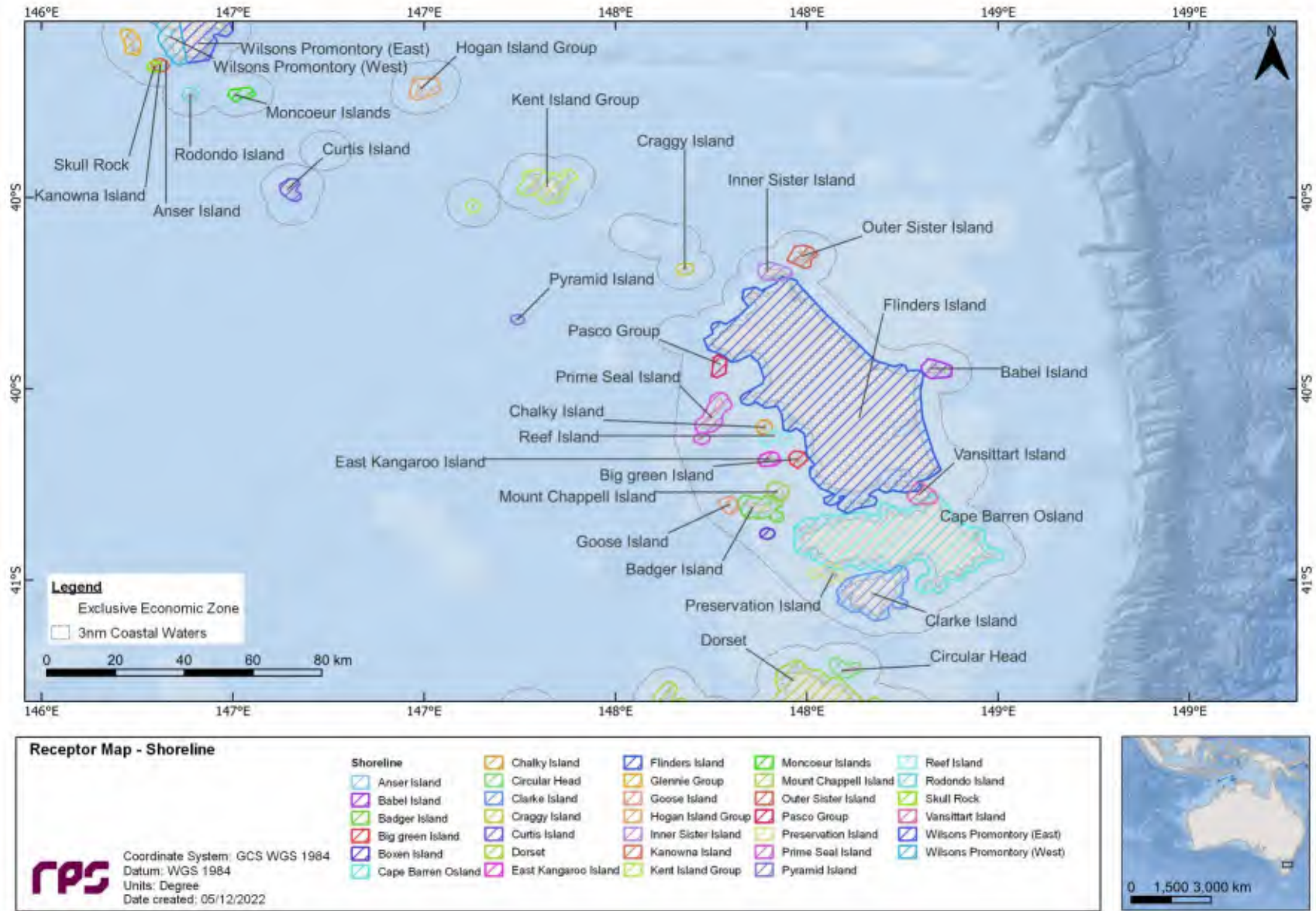


Figure 10.11 Receptor map for shorelines (2 of 3).

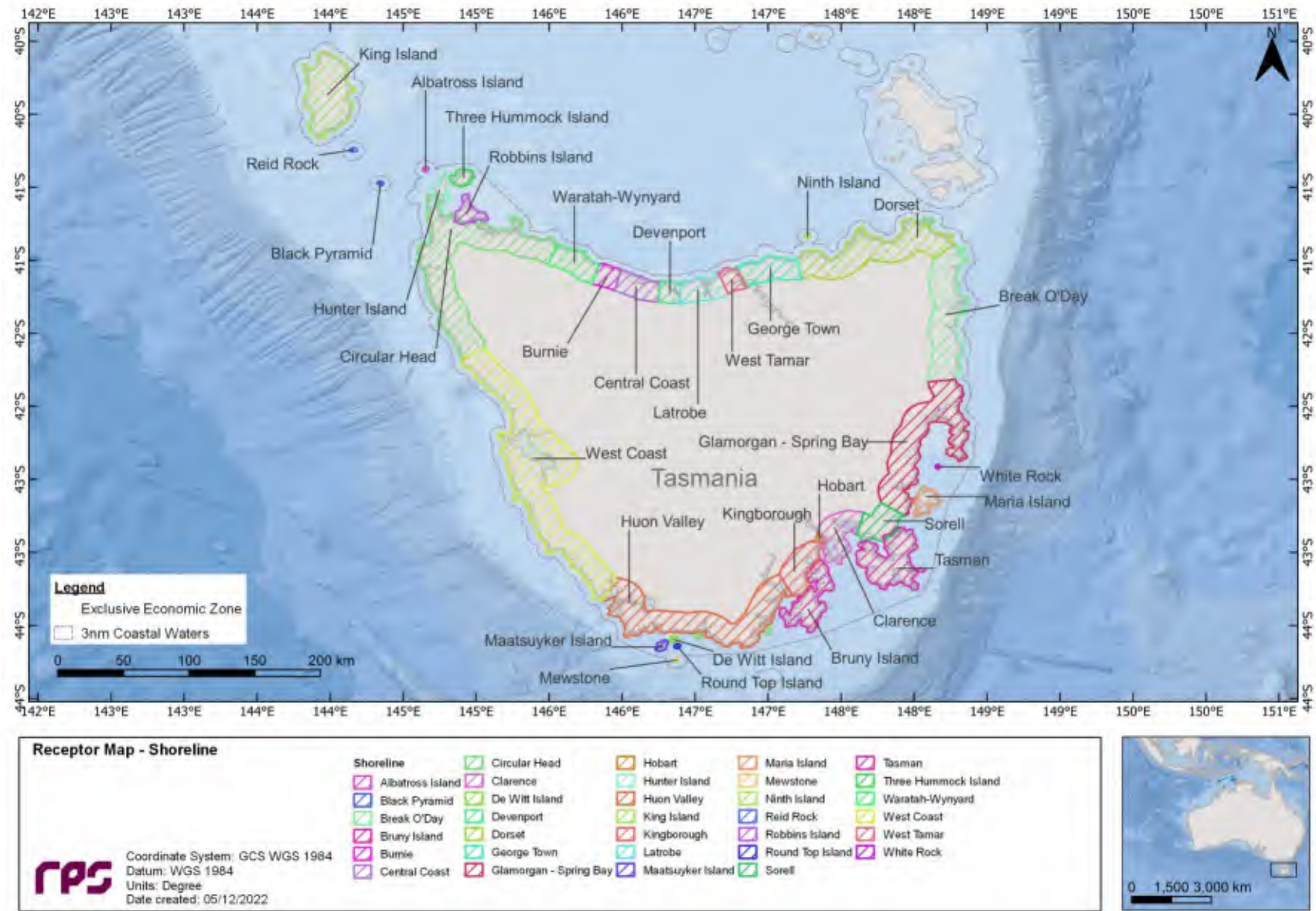


Figure 10.12 Receptor map for shorelines (3 of 3).

11 MODEL SETTINGS

Table 11.1 provides a summary of the spill modelling inputs and thresholds.

The potential risk of exposure to the surrounding waters and contact to shorelines was assessed for summer (October to March) and winter conditions (April to September).

The simulation length was carefully selected based on extensive sensitivity testing. During the sensitivity testing process, sample spill simulations were run for longer than intended durations. Upon completion of the spill simulations, the results were carefully assessed to examine the persistence of the hydrocarbon (i.e. whether the maximum evaporative loss has been achieved for the period modelled; and whether a substantial volume of hydrocarbons remain in the water column (if any)) in conjunction with the extent of floating oil exposure based on reporting thresholds. Once there was agreement between the two factors (i.e. the final fate of hydrocarbon is accounted for, and the full exposure area is identified) the simulation length was deemed appropriate.

Table 11.1 Summary of the of the oil spill modelling inputs and thresholds.

Parameter	Scenario 1 – Subsea LOWC	Scenario 2 – Vessel collision
Number of release locations	4	4
Number of randomly selected spill start times per location and per season	100	
Model period	Summer (October to March) and winter conditions (April to September)	
Oil type	Thylacine condensate	MDO
Spill release rate (m ³ /day)	1,549	-
Total Spill volume (m ³)	139,400	350
Release type	Subsea	Surface
Release duration	90 days	6 hours
Simulation length (days)	120	30
Floating oil exposure thresholds (g/m ²)	1 (low exposure) 10 (moderate exposure) 50 (high exposure)	
Shoreline accumulation thresholds (g/m ²)	10 (low potential exposure) 100 (moderate potential exposure) 1,000 (high potential exposure)	
Dissolved hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, potential low exposure) 50 (50 ppb x 1 hr, potential moderate exposure) 400 (400 ppb x 1 hr, potential high exposure)	
Entrained hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, potential low exposure) 100 (100 ppb x 1 hr, potential high exposure)	

12 CALCULATION OF EXPOSURE RISK

The stochastic sampling approach provides an objective measure of the possible outcomes of a spill because randomly selected environmental conditions with more simulations will tend to use the most commonly occurring conditions, while more unusual conditions will be represented less frequently.

During each simulation, the SIMAP model records the location (by latitude, longitude and depth) of each of the particles (representing a given mass of oil) on or in the water column, at regular time steps. For any particles that contact a shoreline, the model records the accumulation of oil mass that arrives on each section of shoreline over time, less any mass that is lost to evaporation and/or subsequent removal by current and wind forces.

The collective records from all simulations are then analysed by dividing the study region into a three-dimensional grid. For oil particles that are classified as being at the water surface (floating oil), the sum of the mass in all oil particles (including accounting for spreading and dispersion effects) located within a grid cell, divided by the area of the cell provides estimates of the concentration of oil in that grid cell, at each time step. For entrained and dissolved hydrocarbons particles, concentrations are calculated at each time step by summing the mass of particles within a grid cell and dividing by the volume of the grid cell.

The concentrations of oil calculated for each grid cell, at each time step, are then analysed to determine whether concentration estimates exceed defined threshold concentrations over time.

Risks are then summarised as follows:

- The probability of exposure to a location is calculated by dividing the number of spill simulations where any contact occurred above a specified threshold at that location by the total number of replicate spill simulations. For example, if contact occurred at a location (above a specified threshold) during 21 out of 100 simulations, a probability of exposure of 21% is indicated;
- The minimum potential time to a shoreline location is calculated by the shortest time over which oil at a concentration above a threshold was calculated to travel from the source to the location in any of the replicate simulations;
- The maximum potential concentration of oil predicted for each shoreline section is the greatest mass per m² of shoreline calculated to strand at any location within that section during any of the replicate simulations; and
- Similar treatments were undertaken for entrained and dissolved hydrocarbon exposures.

Thus, the minimum time to shoreline and the maximum potential concentration estimates indicate the worst potential outcome of the modelled spill scenario for each section of shoreline. However, the average over the replicates presents an average of the potential outcomes, in terms of hydrocarbons that could strand.

Note also that results quoted for sections of shoreline are derived for any individual location within that section, as a conservative estimate. Locations will represent shoreline lengths of the order of ~1 km, while sections or regions will represent shorelines spanning tens to hundreds of kilometres. The maximum potential concentrations quoted will not necessarily occur over the full extent of each section, therefore multiplying the maximum concentration estimates by the full area of the section is not recommended as this will greatly overestimate the total volume expected on that section.

13 LOCATION 1 LOWC RESULTS

This scenario examined the potential exposure following a subsea LOWC at Location 1. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 13.1 presents the EMBA, Section 13.2 shows the seasonal (or stochastic) results, while Section 13.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

13.1 EMBA

Figure 13.1 shows the EMBA for Location 1. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

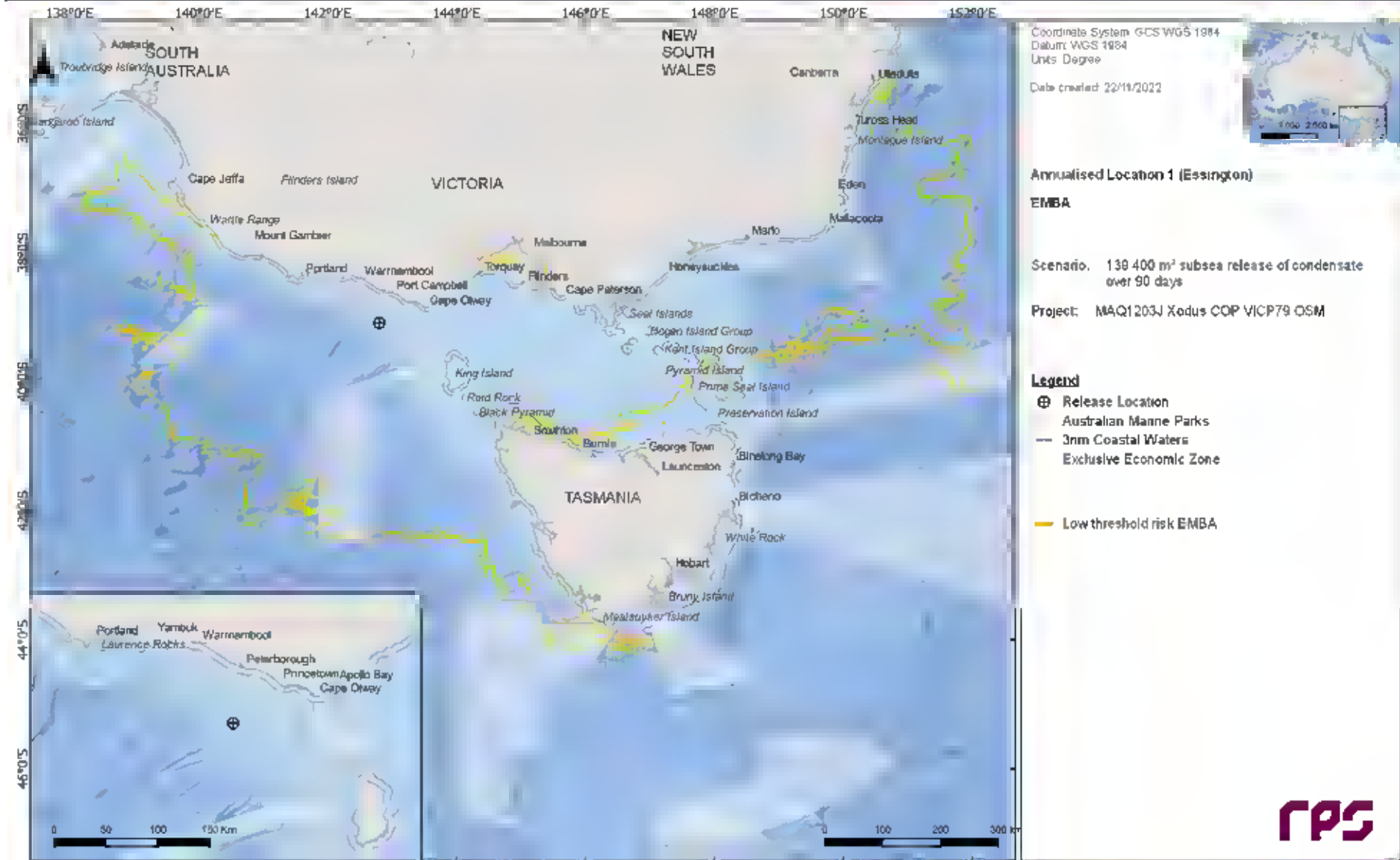


Figure 13.1 Predicted low threshold EMBA from a subsea LOWC at Location 1. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

13.2 Stochastic Analysis

13.2.1 Floating Oil Exposure

Table 13.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 13.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 13.2 to Figure 13.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 1,323 km² and 1,072 km², respectively.

Table 13.1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	190.3	11.6	-
	Maximum distance (km) from release location (99 th percentile)	116.1	11.1	-
	Direction	E	ENE	-
Winter	Maximum distance (km) from release location	306.7	9.3	-
	Maximum distance (km) from release location (99 th percentile)	133.5	9.3	-
	Direction	E	ESE	-

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Table 13.2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 1 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter						
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	
AMP	Apollo	94	-	-	2.67	-	-	100	-	-	1.42	-	-
	Zeehan	5	-	-	41.75	-	-	19	-	-	10.5	-	-
IBRA	Gippsland Plain	-	-	-	-	-	-	8	-	-	13.33	-	-
	King Island	4	-	-	16.13	-	-	24	-	-	3.83	-	-
	Otway Plain	14	-	-	8.33	-	-	24	-	-	3.71	-	-
	Otway Ranges	6	-	-	44.21	-	-	13	-	-	15.33	-	-
	Strzelecki Ranges	-	-	-	-	-	-	1	-	-	47.88	-	-
	Warrnambool Plain	-	-	-	-	-	-	1	-	-	21.88	-	-
	Wilsons Promontory	-	-	-	-	-	-	6	-	-	24.54	-	-
	IMCRA	Central Bass Strait	82	-	-	3.21	-	-	99	-	-	1.63	-
Central Victoria		74	-	-	4.17	-	-	93	-	-	1.83	-	-
Flinders		-	-	-	-	-	-	13	-	-	13.33	-	-
Otway		100	100	-	0.04	0.08	-	100	100	-	0.04	0.08	-
Twofold Shelf		-	-	-	-	-	-	-	-	-	-	-	-
KEF	Bonney Coast Upwelling	-	-	-	-	-	-	1	-	-	19.63	-	-
	West Tasmania Canyons	79	-	-	2	-	-	37	-	-	7.83	-	-
MNP	Twelve Apostles	-	-	-	-	-	-	3	-	-	60.29	-	-
	Wilsons Promontory	-	-	-	-	-	-	3	-	-	44.04	-	-
MS	Marengo Reefs	-	-	-	-	-	-	1	-	-	68.29	-	-
Nearshore Waters	Colac Otway	16	-	-	8.33	-	-	28	-	-	3.71	-	-
	King Island	4	-	-	16.13	-	-	24	-	-	3.83	-	-
NPS4	Wilsons Promontory Marine Park	-	-	-	-	-	-	8	-	-	13.33	-	-
State Waters	Tasmania	4	-	-	16.13	-	-	24	-	-	3.83	-	-
	Victoria	27	-	-	4.04	-	-	61	-	-	3	-	-

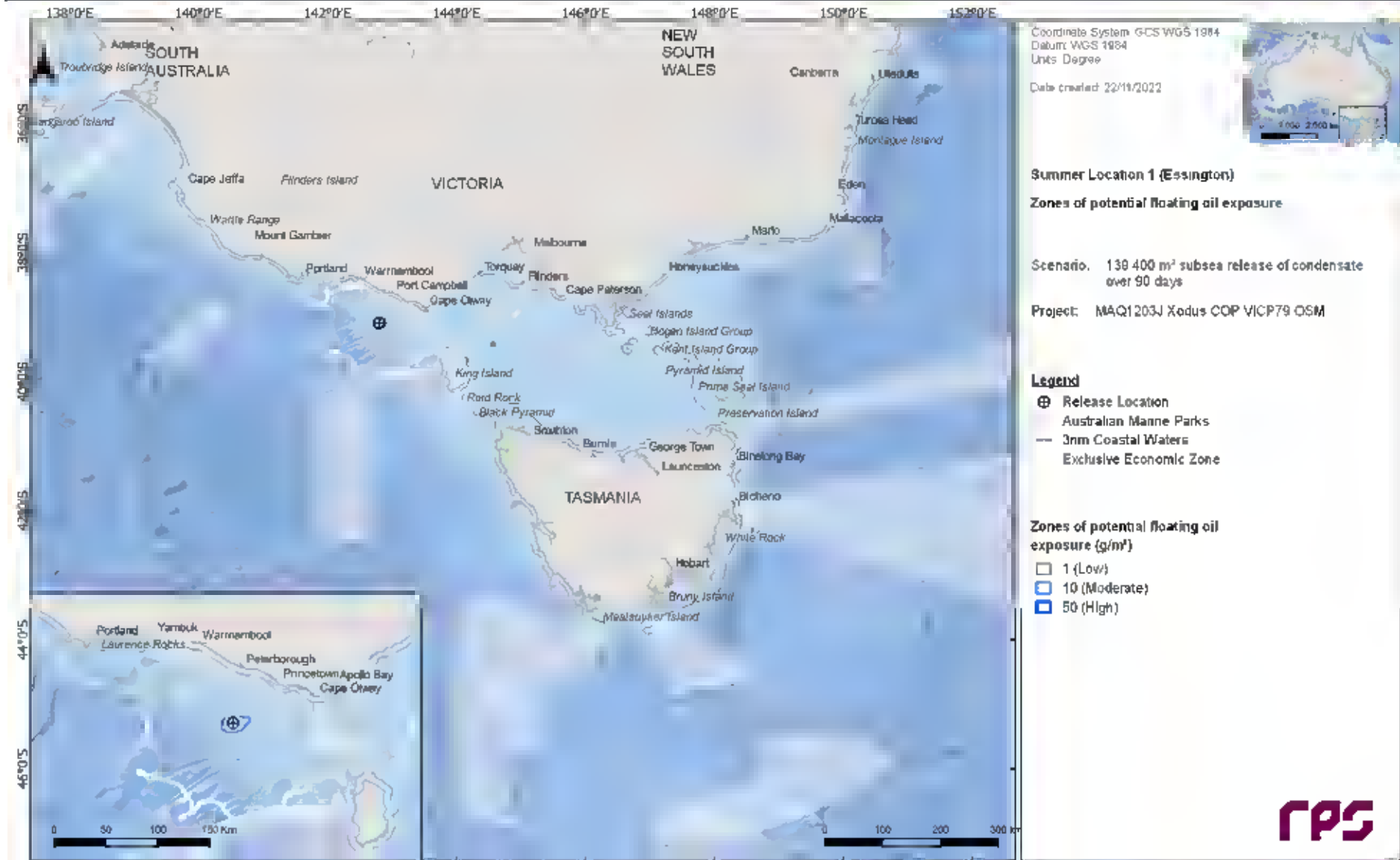


Figure 13.2 Zones of potential floating oil exposure from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

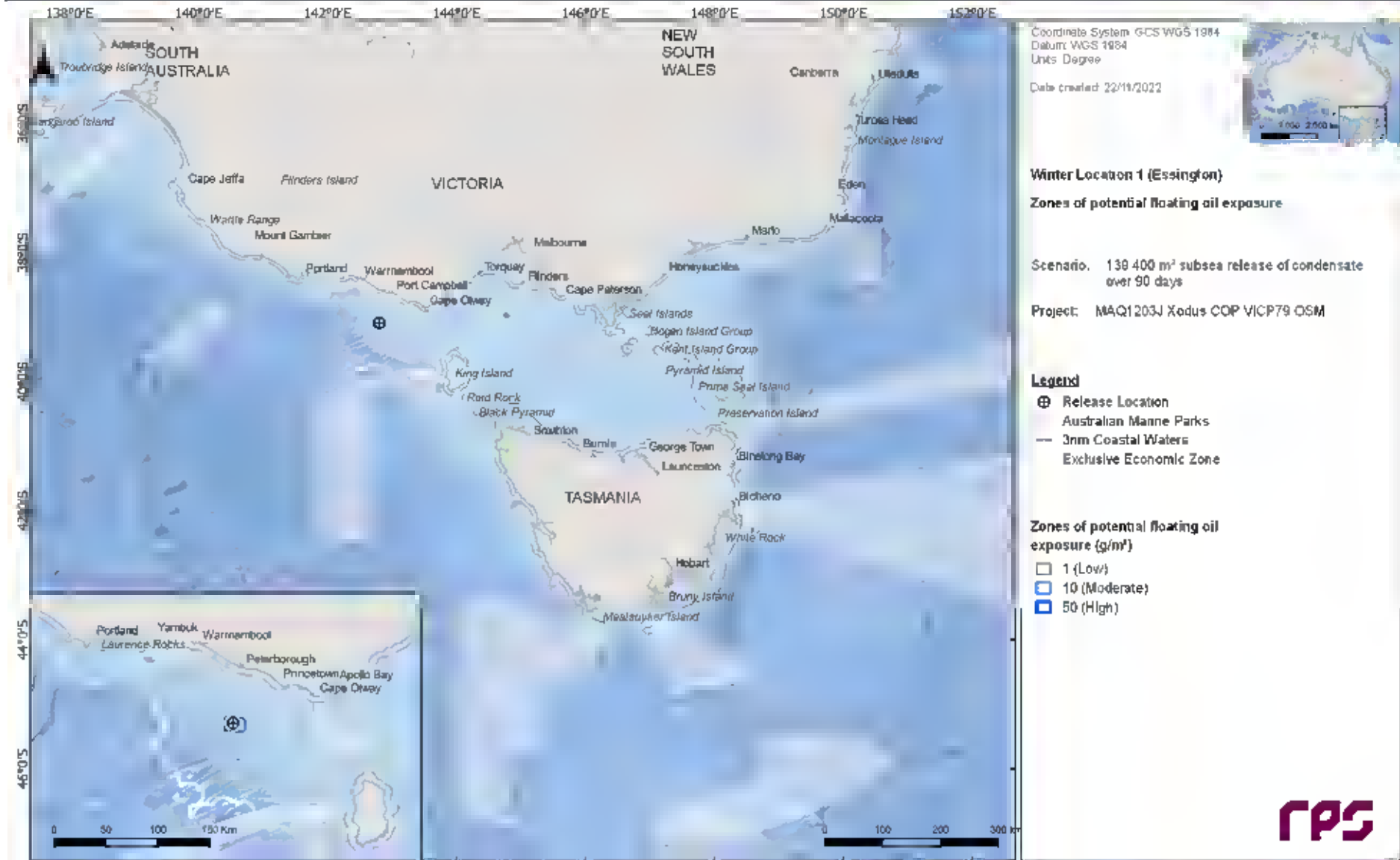


Figure 13.3 Zones of potential floating oil exposure from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.2.2 Shoreline Accumulation

Table 13.3 summarises the predicted accumulation on any shoreline during each season.

Table 13.4 and Table 13.5 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 13.4 and Figure 13.5.

Table 13.3 Summary of accumulation on any shoreline from a subsea LOWC at Location 1 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	91	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	6.00	4.08
Maximum volume of hydrocarbons ashore (m ³)	38.6	51.9
Average volume of hydrocarbons ashore (m ³)	7.1	13
Maximum length of the shoreline at 10 g/m² (km)	105	158
Average shoreline length (km) at 10 g/m² (km)	23.4	53.1
Maximum length of the shoreline at 100 g/m² (km)	6	11
Average shoreline length (km) at 100 g/m² (km)	2.7	3.7
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 13.4 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 1 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	10	-	-	76.92	-	-	17	23	< 0.1	0.5	1.2	-	-	1.9	-	-
Bass Coast	9	-	-	27.83	-	-	12	19	< 0.1	1.3	1.4	-	-	4.8	-	-
Bega Valley	6	-	-	74.96	-	-	19	34	< 0.1	0.9	2.2	-	-	2.9	-	-
Circular Head	-	-	-	-	-	-	-	-	< 0.1	0.4	-	-	-	-	-	-
Colac Otway	55	17	-	6	8.71	-	30	222	3.7	24.4	15	3.1	-	62.1	4.8	-
Corangamite	33	1	-	12.29	78.04	-	21	100	0.6	3.3	4.1	1	-	14.3	1	-
Curtis Island	-	-	-	-	-	-	-	-	< 0.1	0.2	-	-	-	-	-	-
East Gippsland	3	-	-	72.13	-	-	23	30	< 0.1	0.7	1.3	-	-	1.9	-	-
Glenelg	8	3	-	18.33	31.46	-	19	138	0.3	6.4	10.3	1	-	25.8	1	-
Glennie Group	9	-	-	74.13	-	-	14	20	< 0.1	0.9	1.6	-	-	4.8	-	-
Grant	1	-	-	42.88	-	-	18	18	0.2	0.2	1	-	-	1	-	-
Greater Geelong	3	-	-	30.79	-	-	12	18	< 0.1	0.7	2.2	-	-	2.9	-	-
Hogan Island Group	2	-	-	96.46	-	-	20	21	< 0.1	0.4	1	-	-	1	-	-
Hunter Island	1	-	-	70.00	-	-	10	10	0.2	0.2	1	-	-	1	-	-
Kanowna Island	9	-	-	75.75	-	-	22	48	< 0.1	0.9	1.4	-	-	2.9	-	-
Kent Island Group	3	-	-	86.83	-	-	12	13	< 0.1	0.3	1.3	-	-	1.9	-	-
King Island	62	9	-	12.46	16.13	-	22	296	1.6	10.2	5.9	1.1	-	30.6	1.9	-
Lady Julia Percy Island	2	-	-	29.54	-	-	21	22	< 0.1	0.2	1	-	-	1	-	-
Laurence Rocks	3	-	-	21.42	-	-	16	23	< 0.1	0.4	2.2	-	-	2.9	-	-
Moncoeur Islands	8	-	-	61.88	-	-	20	29	< 0.1	0.7	1.6	-	-	2.9	-	-
Montague Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Mornington Peninsula	11	-	-	30.71	-	-	15	27	0.1	1.9	2.1	-	-	5.7	-	-
Moyne	22	-	-	20.50	-	-	21	80	0.4	6.5	5.4	-	-	18.2	-	-
Norman Island	9	-	-	69.42	-	-	18	48	< 0.1	0.6	1	-	-	1	-	-

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Phillip Island	7	-	-	31.75	-	-	21	88	0.2	2.9	4.2	-	-	10.5	-	-
Reid Rock	1	-	-	89.96	-	-	10	10	0.3	0.3	1	-	-	1	-	-
Rodondo Island	4	-	-	73.83	-	-	19	34	< 0.1	0.4	1	-	-	1	-	-
Seal Islands	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Shellback Island	2	-	-	91.67	-	-	12	13	< 0.1	0.2	1	-	-	1	-	-
Skull Rock	6	-	-	75.75	-	-	24	48	< 0.1	0.8	1.4	-	-	1.9	-	-
South Gippsland	24	1	-	21.92	96.46	-	19	124	0.9	16.5	9.2	1	-	41.1	1	-
Surf Coast	20	-	-	17.83	-	-	17	96	0.6	11.8	5.1	-	-	20.1	-	-
Warrnambool	6	-	-	29.96	-	-	15	61	< 0.1	1.7	1.8	-	-	4.8	-	-
West Coast	1	-	-	69.04	-	-	11	12	0.6	0.6	1.9	-	-	1.9	-	-
Anser Island	10	-	-	76.92	-	-	17	23	< 0.1	0.5	1.2	-	-	1.9	-	-
Bass Coast	9	-	-	27.83	-	-	12	19	< 0.1	1.3	1.4	-	-	4.8	-	-

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Table 13.5 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 1 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	33	-	-	13.96	-	-	25	66	0.2	0.8	1.4	-	-	1.9	-	-
Bass Coast	34	-	-	14.46	-	-	17	54	0.5	4.5	4.4	-	-	15.3	-	-
Bega Valley	9	-	-	25.92	-	-	16	32	< 0.1	1	1.8	-	-	3.8	-	-
Circular Head	11	-	-	27.04	-	-	19	66	0.3	2.5	5.8	-	-	9.6	-	-
Colac Otway	75	15	-	4.25	14.38	-	25	312	4.1	26.4	14.4	3.4	-	58.3	6.7	-
Corangamite	49	-	-	4.08	-	-	21	92	0.6	3.4	3.5	-	-	11.5	-	-
Curtis Island	10	-	-	27.29	-	-	16	31	< 0.1	0.6	1.4	-	-	1.9	-	-
East Gippsland	20	-	-	23.13	-	-	14	29	0.1	0.6	1.5	-	-	3.8	-	-
Glenelg	2	1	-	84.13	95.42	-	27	114	0.1	6.5	21	1	-	22.9	1	-
Glennie Group	47	-	-	15.00	-	-	16	63	0.3	1.8	2	-	-	5.7	-	-
Grant	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Greater Geelong	5	-	-	18.38	-	-	19	26	< 0.1	0.9	1.3	-	-	1.9	-	-
Hogan Island Group	15	-	-	19.29	-	-	13	23	< 0.1	0.4	1.1	-	-	1.9	-	-
Hunter Island	1	-	-	47.75	-	-	10	10	0.4	0.4	1	-	-	1	-	-
Kanowna Island	39	-	-	17.42	-	-	21	82	0.2	1.9	2	-	-	3.8	-	-
Kent Island Group	17	-	-	23.42	-	-	18	78	0.2	1.8	2.2	-	-	3.8	-	-
King Island	76	32	-	8.46	15.04	-	29	494	5.2	25.1	19.1	1.9	-	47.8	3.8	-
Lady Julia Percy Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Laurence Rocks	2	-	-	84.33	-	-	17	22	< 0.1	0.4	1.9	-	-	1.9	-	-
Moncoeur Islands	34	-	-	17.67	-	-	18	40	0.2	0.8	1.7	-	-	2.9	-	-
Montague Island	7	-	-	48.13	-	-	15	22	< 0.1	0.3	1.1	-	-	1.9	-	-
Mornington Peninsula	24	-	-	14.08	-	-	17	49	0.4	2.4	3.3	-	-	6.7	-	-
Moyne	23	-	-	16.50	-	-	26	90	0.5	6.7	5.2	-	-	17.2	-	-
Norman Island	48	9	-	16.29	39.00	-	46	372	0.8	10.1	2.2	2	-	3.8	2.9	-

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Phillip Island	32	1	-	14.08	20.79	-	18	101	0.5	3	4.7	1	-	10.5	1	-
Reid Rock	1	-	-	61.13	-	-	18	18	0.3	0.3	1	-	-	1	-	-
Rodondo Island	27	-	-	16.08	-	-	17	40	< 0.1	0.5	1	-	-	1	-	-
Seal Islands	9	-	-	17.17	-	-	20	38	0.1	1.4	2	-	-	3.8	-	-
Shellback Island	26	-	-	14.54	-	-	21	46	< 0.1	0.6	1	-	-	1	-	-
Skull Rock	39	-	-	17.42	-	-	21	82	0.2	1.4	1.6	-	-	2.9	-	-
South Gippsland	75	16	-	13.29	14.08	-	26	300	3.8	15.8	14	2	-	43	3.8	-
Surf Coast	20	-	-	13.38	-	-	20	94	0.7	10.7	6.2	-	-	20.1	-	-
Warrnambool	5	-	-	17.63	-	-	21	48	< 0.1	1.7	3.4	-	-	4.8	-	-
West Coast	3	-	-	40.63	-	-	11	13	0.1	0.9	1.3	-	-	1.9	-	-
Anser Island	33	-	-	13.96	-	-	25	66	0.2	0.8	1.4	-	-	1.9	-	-
Bass Coast	34	-	-	14.46	-	-	17	54	0.5	4.5	4.4	-	-	15.3	-	-

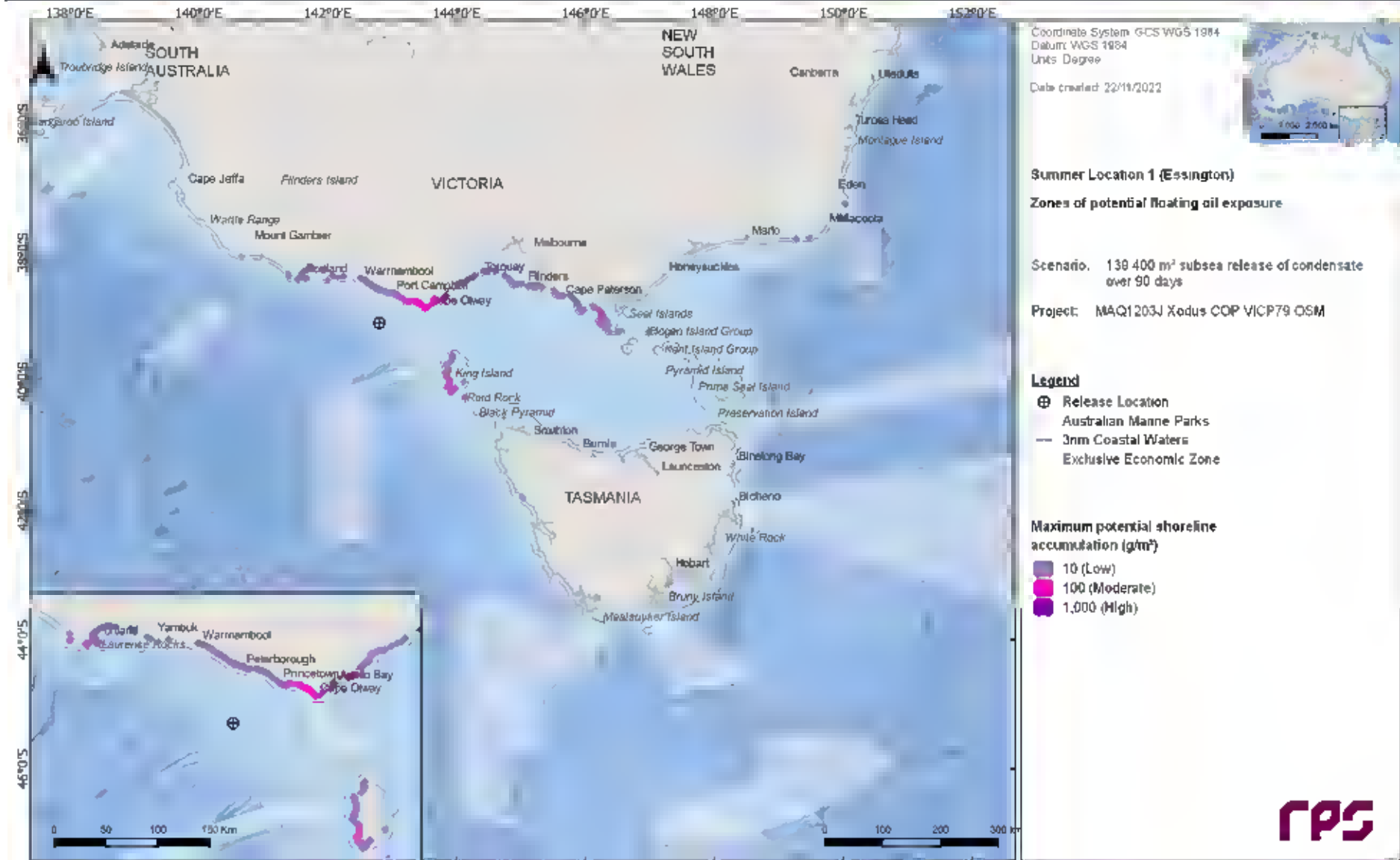


Figure 13.4 Maximum potential shoreline loading from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

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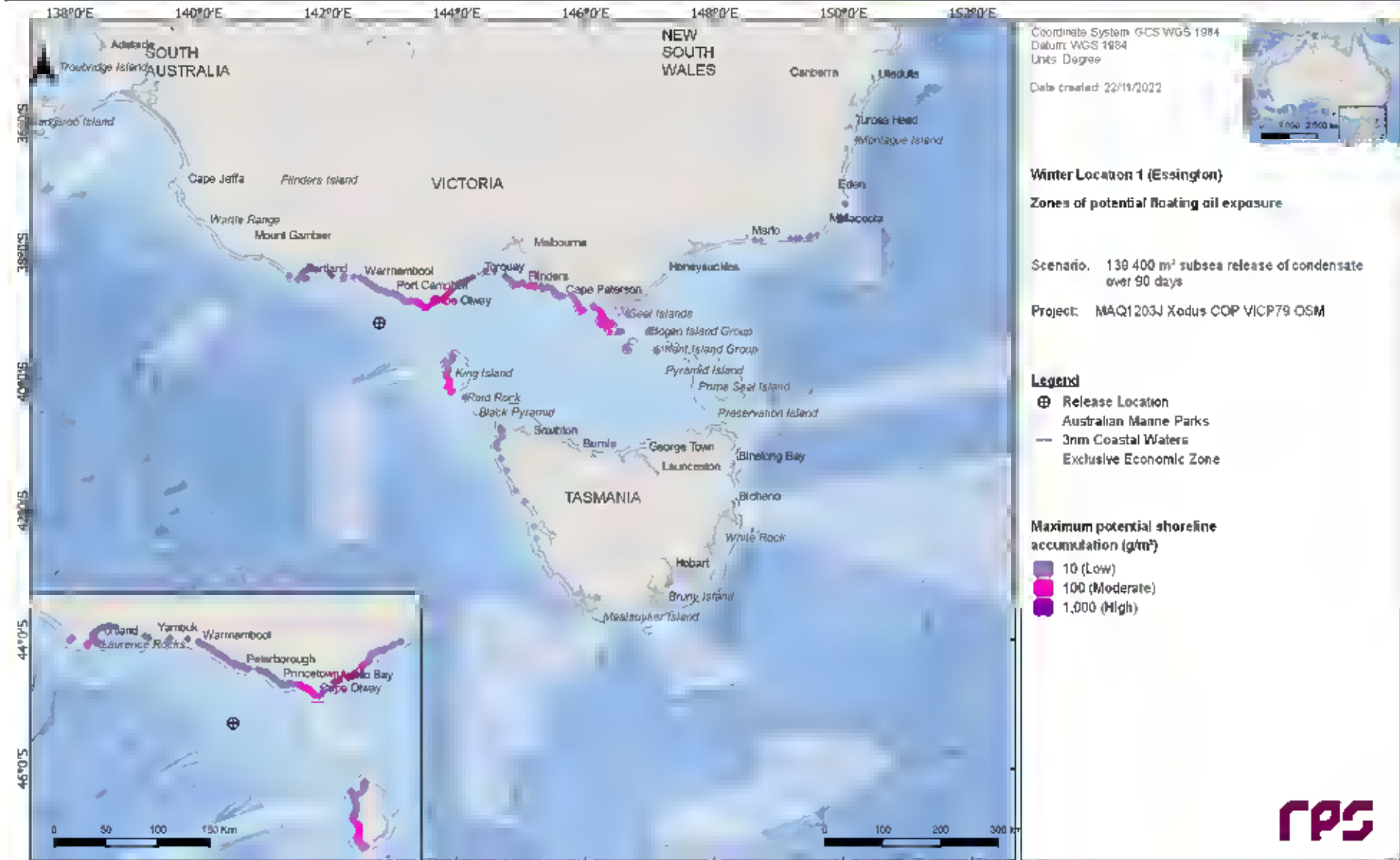


Figure 13.5 Maximum potential shoreline loading from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.2.3 In-water exposure

13.2.3.1 Dissolved Hydrocarbons

Table 13.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 13.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 13.6 and Figure 13.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 13.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	743	625	367
	Maximum distance (km) from release location (99 th percentile)	546	386	175
	Direction	ENE	E	E
Winter	Maximum distance (km) from release location	748	608	293
	Maximum distance (km) from release location (99 th percentile)	619	396	226
	Direction	ENE	E	E

Table 13.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Moderate	High		Low	Moderate	High	
AMP	Apollo	4,187	98	97	62	4,113	100	100	73
	Beagle	451	13	6	1	352	45	9	-
	Boags	23	3	-	-	27	2	-	-
	Franklin	175	19	2	-	107	10	1	-
	Nelson	12	1	-	-	21	1	-	-
	Zeehan	1,649	95	79	9	2,538	85	62	9
IBRA	Bateman	7	-	-	-	15	2	-	-
	East Gippsland Lowlands	45	2	-	-	59	4	1	-
	Flinders	84	10	1	-	110	21	2	-
	Gippsland Plain	312	10	2	-	201	44	4	-
	Glenelg Plain	34	3	-	-	8	-	-	-
	King Island	868	55	22	1	745	76	45	2
	Otway Plain	2,681	66	41	7	857	83	58	6
	Otway Ranges	1,057	58	34	4	779	80	51	4
	South East Coastal Ranges	3	-	-	-	13	1	-	-
	Strzelecki Ranges	106	11	1	-	217	40	4	-
	Tasmanian West	16	2	-	-	28	1	-	-
	Warrnambool Plain	224	47	12	-	320	54	17	-
	Wilsons Promontory	307	13	6	-	274	57	14	-
	IMCRA	Batemans Shelf	16	1	-	-	22	2	-
Boags		31	2	-	-	35	3	-	-
Central Bass Strait		3,608	98	96	45	3,282	100	100	62
Central Victoria		2,433	98	96	39	2,293	100	100	58
Coorong		41	1	-	-	5	-	-	-
Flinders		528	18	6	1	614	64	23	1
Franklin		169	22	4	-	166	10	3	-
Otway		8,922	100	100	100	7,863	100	100	100
Twofold Shelf		400	11	3	1	295	25	4	-
Victorian Embayments		132	5	2	-	93	15	1	-
KEF	Victorian Embayments	47	3	-	-	100	6	1	-
	Big Horseshoe Canyon	2	-	-	-	10	1	-	-

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	Bonney Coast Upwelling	524	15	6	1	469	7	6	1
	Upwelling East of Eden	74	5	1	-	149	12	2	-
	West Tasmania Canyons	3,702	100	100	65	2,415	89	81	29
MNP	Bunurong	48	5	-	-	148	20	3	-
	Cape Howe	38	2	-	-	28	4	-	-
	Churchill Island	4	0	-	-	12	2	-	-
	Corner Inlet	31	3	-	-	42	4	-	-
	Discovery Bay	18	2	-	-	10	1	-	-
	Ninety Mile Beach	17	1	-	-	67	4	1	-
	Point Addis	82	11	2	-	115	21	3	-
	Point Hicks	15	1	-	-	34	4	-	-
	Port Phillip Heads	21	3	-	-	24	2	-	-
	Twelve Apostles	224	39	14	-	651	40	12	1
	Wilsons Promontory	250	13	4	-	169	55	12	-
MP	Batemans	10	-	-	-	19	2	-	-
	Lower South East	6	-	-	-	28	1	-	-
MS	Beware Reef	4	-	-	-	53	4	1	-
	Marengo Reefs	416	40	12	1	411	69	33	1
	Merri	12	2	-	-	9	-	-	-
	Mushroom Reef	63	3	1	-	43	13	-	-
	The Arches	46	11	-	-	33	7	-	-
Nearshore Waters	Albatross Island	11	1	-	-	21	4	-	-
	Anser Island	136	12	2	-	87	51	9	-
	Bass Coast	34	3	-	-	74	15	1	-
	Bega Valley	29	2	-	-	39	4	-	-
	Black Pyramid	63	13	1	-	48	9	-	-
	Circular Head	21	3	-	-	28	2	-	-
	Colac Otway	2,681	66	41	7	857	83	58	6
	Corangamite	207	48	13	-	395	54	18	-
	Curtis Island	84	8	1	-	110	18	2	-
	East Gippsland	30	2	-	-	59	4	1	-
	Eurobodalla	5	-	-	-	15	2	-	-
	French Island	11	1	-	-	20	1	-	-
	Gabo Island	45	2	-	-	31	3	-	-
	Glenelg	34	3	-	-	10	1	-	-
	Glennie Group	84	13	1	-	169	54	11	-
	Greater Geelong	50	4	-	-	32	3	-	-
	Hogan Island Group	52	10	1	-	76	21	2	-
Hunter Island	19	1	-	-	50	2	-	-	
Kanowna Island	157	12	5	-	171	57	12	-	

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	Kent Island Group	7	-	-	-	24	5	0	0
	King Island	868	55	22	1	745	76	45	2
	Lady Julia Percy Island	49	3	-	-	99	2	1	-
	Laurence Rocks	27	2	-	-	12	1	-	-
	Martins Island	19	2	-	-	65	1	1	-
	Moncoeur Islands	303	12	6	-	191	46	10	-
	Mornington Peninsula	312	5	1	-	76	16	2	-
	Moyne	133	19	3	-	320	13	2	-
	Mud Island	5	-	-	-	16	1	-	-
	Norman Island	29	9	-	-	274	33	5	-
	Phillip Island	117	6	2	-	116	22	3	-
	Reid Rock	179	16	2	-	181	21	4	-
	Robbins Island	1	-	-	-	13	1	-	-
	Rodondo Island	238	13	5	-	273	54	11	-
	Seal Islands	245	5	1	-	76	20	1	-
	Shellback Island	35	6	-	-	158	30	4	-
	Skull Rock	136	15	4	-	107	54	14	-
	South Gippsland	106	12	1	-	217	49	5	-
	Surf Coast	384	12	5	-	87	28	3	-
	Three Hummock Island	8	-	-	-	26	1	-	-
	Warrnambool	25	3	-	-	57	3	1	-
	Wellington	53	2	1	-	92	8	2	-
	West Coast	15	1	-	-	19	1	0	-
	Bunurong Marine Park	24	1	-	-	72	12	1	-
	Corner Inlet Marine and Coastal Park	47	3	-	-	100	3	1	-
	Nooramunga Marine and Coastal Park	31	2	-	-	88	6	1	-
NPS4	Shallow Inlet Marine and Coastal Park	9	0	-	-	99	4	2	-
	Wilsons Promontory Marine Park	26	5	-	-	158	24	4	-
	Wilsons Promontory Marine Reserve	34	12	-	-	142	46	8	-
NP	Kent Group	12	1	-	-	30	3	-	-
	Corner Inlet	47	3	-	-	100	6	1	-
Ramsar	Lavinia	36	4	-	-	28	9	-	-
	Port Phillip Bay (Western)	24	1	-	-	18	1	-	-

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	Shoreline) and Bellarine Peninsula								
	Western Port	17	1	-	-	68	4	1	-
	Corner Inlet	47	3	-	-	100	6	1	-
	Bell Reef	84	19	2	-	184	17	2	-
	Beware Reef	4	-	-	-	53	4	1	-
	Bravenes Rock	624	61	34	2	361	78	44	-
RSB	Brown Rocks	7	-	-	-	15	1	-	-
	Cody Bank	84	14	4	-	157	52	11	-
	Cutter Rock	58	12	1	-	126	31	4	-
	New Zealand Star Bank	26	2	-	-	24	4	-	-
	New South Wales	30	2	-	-	39	4	-	-
State Waters	South Australia	26	1	-	-	28	1	-	-
	Tasmania	883	67	39	5	1,071	80	62	8
	Victoria	2,836	83	58	12	1,867	96	79	13

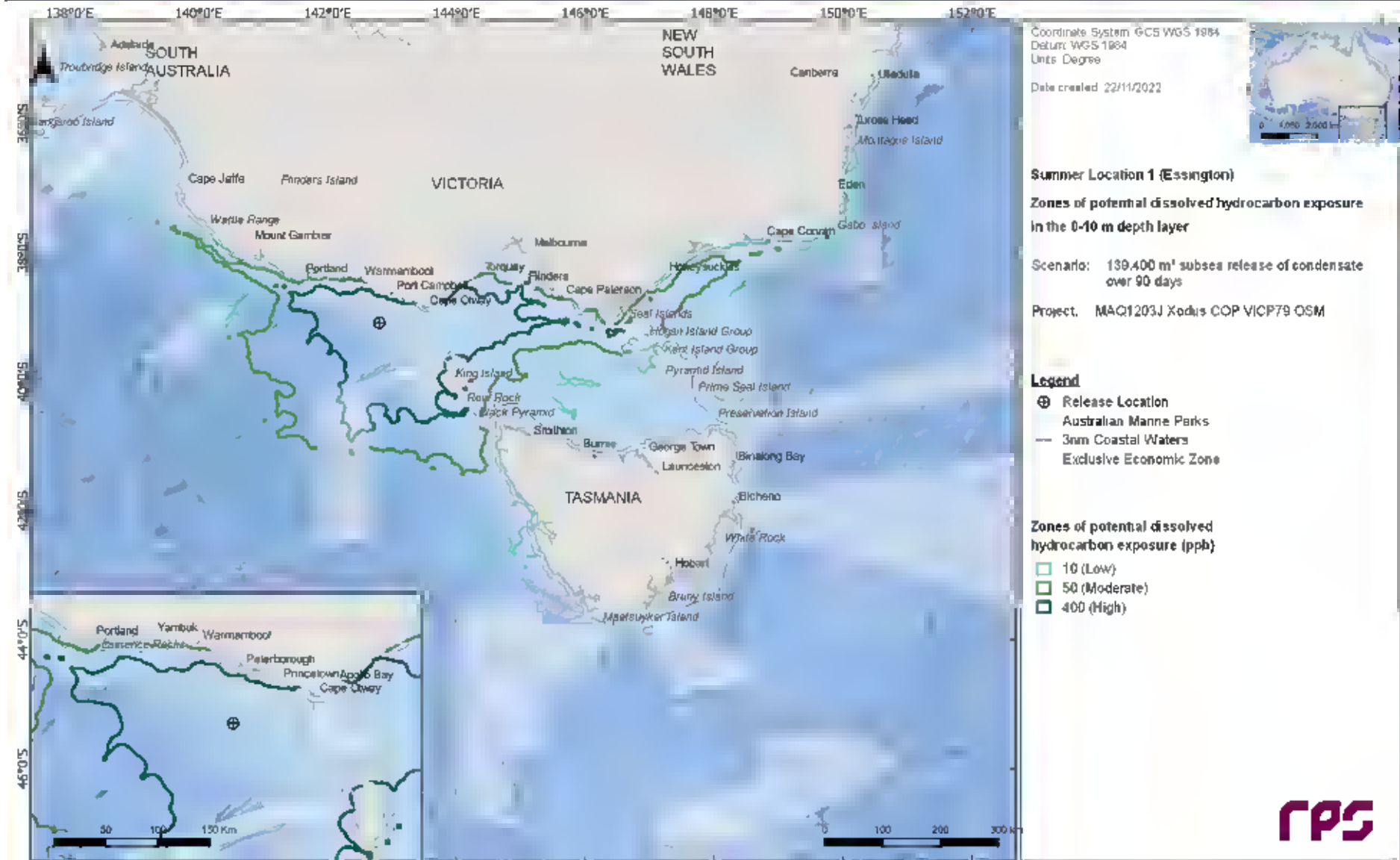


Figure 13.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

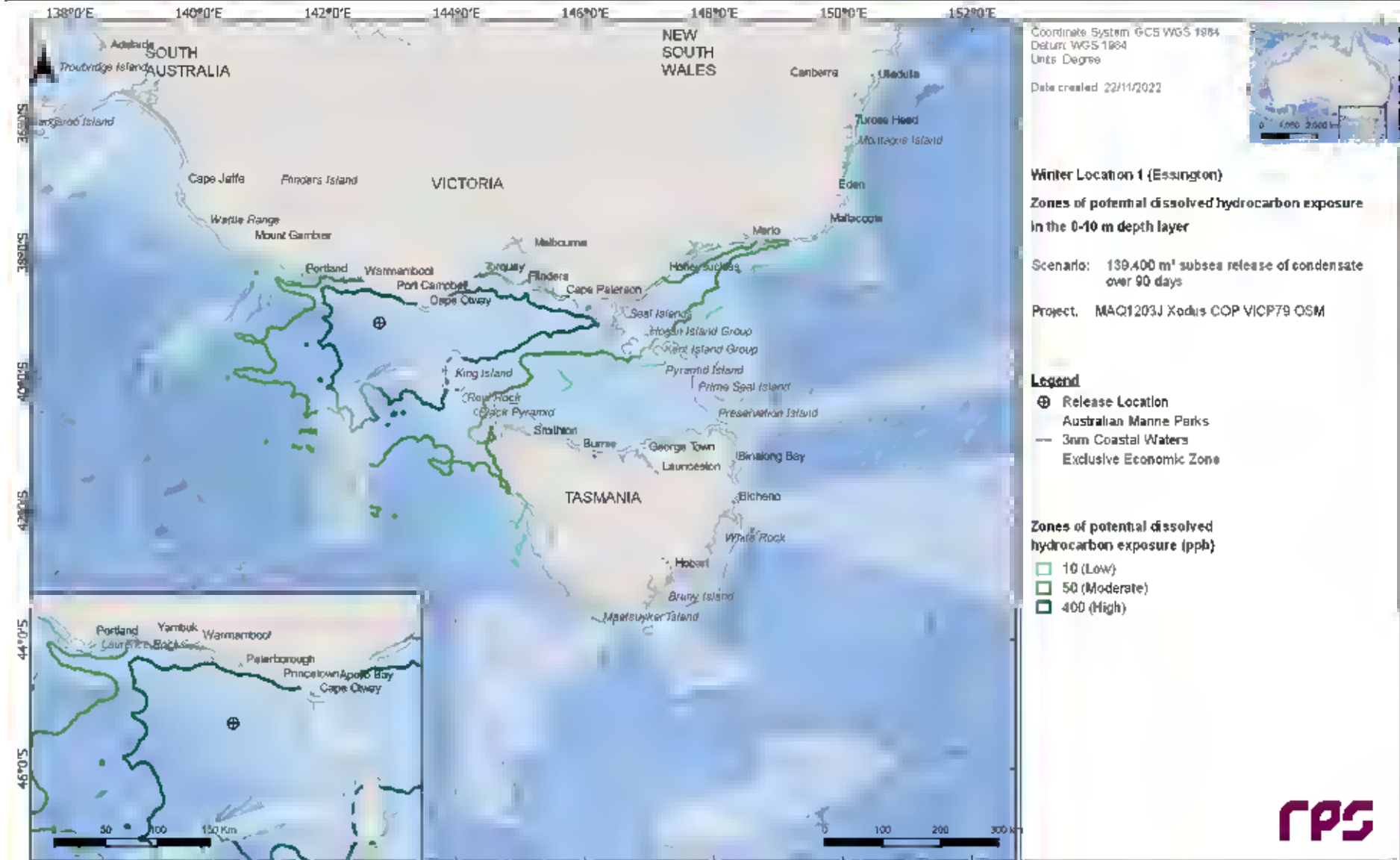


Figure 13.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.2.3.2 Entrained Hydrocarbons

Table 13.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 13.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 13.8 to Figure 13.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 13.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	868	699
	Maximum distance (km) from release location (99 th percentile)	773	412
	Direction	ENE	ENE
Winter	Maximum distance (km) from release location	867	440
	Maximum distance (km) from release location (99 th percentile)	799	350
	Direction	ENE	N

Table 13.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer				Winter		
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	1,758	100	100	1,752	100	100
	Beagle	205	54	9	277	90	24
	Boags	61	50	-	62	28	-
	East Gippsland	40	12	-	41	27	-
	Flinders	13	1	-	12	1	-
	Franklin	111	77	1	136	40	10
	Huon	13	2	-	10	1	-
	Nelson	42	10	-	19	3	-
	Tasman Fracture	17	8	-	19	8	-
	Zeehan	680	100	81	663	93	71
IBRA	Bateman	29	5	-	34	23	-
	Bridgewater	154	28	3	159	2	2
	East Gippsland Lowlands	63	23	-	60	57	-
	Flinders	142	35	3	149	74	13
	Gippsland Plain	172	68	4	271	91	23
	Glenelg Plain	175	32	3	185	2	2
	King Island	472	94	37	655	89	66
	Otway Plain	1,664	87	52	1,324	92	65
	Otway Ranges	852	87	45	635	92	64
	South East Coastal Ranges	31	7	-	22	19	-
	Strzelecki Ranges	94	54	-	243	91	11
	Tasmanian West	28	40	-	36	14	-
	Victorian Volcanic Plain	15	4	-	6	-	-
	Warrnambool Plain	388	72	41	427	80	36
	Wilsons Promontory	303	57	13	392	92	32
IMCRA	Batemans Shelf	127	19	3	90	35	-
	Boags	69	59	-	68	26	-
	Central Bass Strait	1,536	100	98	1,627	100	100
	Central Victoria	1,414	100	100	1,469	100	100
	Coorong	45	6	-	23	2	-
	Davey	18	8	-	9	-	-
	Flinders	315	63	13	401	93	37

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	Franklin	88	70	-	148	33	9
	Otway	14,637	100	100	12,971	100	100
	Twofold Shelf	148	41	5	167	76	4
	Victorian Embayments	135	63	2	136	74	9
	Big Horseshoe Canyon	15	15	-	31	38	-
	Bonney Coast Upwelling	336	45	22	335	25	9
	Canyons on the eastern continental slope	48	7	-	44	14	-
KEF	Seamounts South and east of Tasmania	12	3	-	11	1	-
	Shelf rocky reefs	35	8	-	35	22	-
	Upwelling East of Eden	146	26	3	100	69	-
	West Tasmania Canyons	1,524	100	100	1,602	97	86
	Bunurong	57	46	-	170	91	5
	Cape Howe	69	22	-	57	57	-
	Churchill Island	60	36	-	76	62	-
	Corner Inlet	10	1	-	13	3	-
	Discovery Bay	105	18	1	69	2	-
	French Island	12	3	-	22	16	-
MNP	Ninety Mile Beach	10	1	-	20	3	-
	Point Addis	339	47	6	334	69	4
	Point Hicks	64	24	-	52	60	-
	Port Phillip Heads	135	34	1	135	53	2
	Twelve Apostles	457	69	42	483	75	35
	Wilson's Promontory	293	56	10	386	92	36
	Yaringa	6	-	-	13	1	-
	Batemans	32	6	-	38	25	-
MP	Jervis Bay	3	-	-	10	1	-
	Lower South East	45	12	-	33	2	-
	Upper South East	12	2	-	12	1	-
	Beware Reef	35	7	-	30	19	-
	Marengo Reefs	508	76	41	531	86	57
MS	Merri	124	27	2	118	10	1
	Mushroom Reef	95	62	-	109	74	2
	The Arches	267	54	19	129	41	4
	Albatross Island	46	52	-	45	21	-
	Anser Island	287	55	6	283	91	31
Nearshore Waters	Bass Coast	76	41	-	181	79	11
	Bega Valley	61	19	-	48	50	-
	Black Pyramid	88	67	-	82	39	-
	Circular Head	28	31	-	85	14	-

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Colac Otway	1,664	87	52	1,324	92	65	
Corangamite	388	75	41	427	81	37	
Craggy Island	15	5	-	12	1	-	
Curtis Island	70	32	-	145	70	13	
East Gippsland	61	23	-	55	57	-	
Eurobodalla	20	4	-	25	18	-	
Frankston	10	1	-	16	13	-	
French Island	36	33	-	55	50	-	
Gabo Island	71	20	-	60	55	-	
Glenelg	175	31	3	185	2	2	
Glennie Group	301	57	10	377	92	31	
Grant	38	12	-	34	2	-	
Greater Geelong	140	33	3	145	50	4	
Hogan Island Group	142	35	3	148	74	3	
Hunter Island	38	32	-	53	18	-	
Kanowna Island	293	56	6	287	91	32	
Kent Island Group	60	24	-	99	49	-	
King Island	492	94	38	655	89	66	
Lady Julia Percy Island	241	35	4	240	9	2	
Laurence Rocks	174	26	3	177	2	2	
Martins Island	11	3	-	6	-	-	
Moncoeur Islands	224	54	12	190	90	21	
Montague Island	29	5	-	34	23	-	
Mornington Peninsula	131	68	4	129	77	8	
Moyne	363	61	18	390	46	19	
Mud Island	72	31	-	59	42	-	
Norman Island	189	49	7	392	92	29	
Phillip Island	129	66	2	168	78	14	
Pyramid Island	25	6	-	22	24	-	
Reid Rock	218	80	7	225	69	4	
Robe	12	2	-	12	1	-	
Rodondo Island	181	56	13	159	91	28	
Seal Islands	49	27	-	73	73	-	
Shellback Island	177	50	4	238	92	23	
Skull Rock	303	57	6	291	91	31	
South Gippsland	229	54	6	341	91	30	
Surf Coast	248	45	6	259	69	20	
Three Hummock Island	24	23	-	33	13	-	
Warrnambool	233	33	4	255	20	6	
Wellington	7	-	-	29	5	-	
West Coast	28	40	-	36	14	-	
NP	Kent Group	60	22	-	98	44	-

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NPS4	Bunurong Marine Park	54	41	-	181	75	9
	Corner Inlet Marine and Coastal Park	49	28	-	69	60	-
	Nooramunga Marine and Coastal Park	6	-	-	26	5	-
	Shallow Inlet Marine and Coastal Park	43	27	-	52	58	-
	Wilsons Promontory Marine Park	178	49	4	308	91	23
	Wilsons Promontory Marine Reserve	267	55	10	363	91	29
Ramsar	Corner Inlet	49	28	-	69	60	-
	Gippsland Lakes	5	-	-	14	4	-
	Genelg Estuary and Discovery Bay Wetlands	74	12	-	12	2	-
	Lavinia	51	31	-	73	58	-
	Piccaninnie Ponds Karst Wetlands	24	11	-	17	2	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	111	28	1	116	41	2
Western Port	51	45	-	82	60	-	
RSB	Bell Reef	159	79	6	153	57	1
	Beware Reef	35	7	-	30	19	-
	Bravenes Rock	642	85	56	607	90	63
	Brown Rocks	22	24	-	45	13	-
	Cody Bank	74	68	-	128	94	4
	Cutter Rock	108	44	2	237	77	10
	Endeavour Reef	18	5	-	13	7	-
	New Zealand Star Bank	99	25	-	76	67	-
	Wakitipu Rock	23	5	-	19	18	-
	Warrego Rock	17	5	-	12	1	-
Wright Rock	18	5	-	17	15	-	
State Waters	New South Wales	86	22	-	68	54	-
	South Australia	50	12	-	49	2	-
	Tasmania	675	96	49	764	93	81
	Victoria	1,664	97	76	1,332	100	84

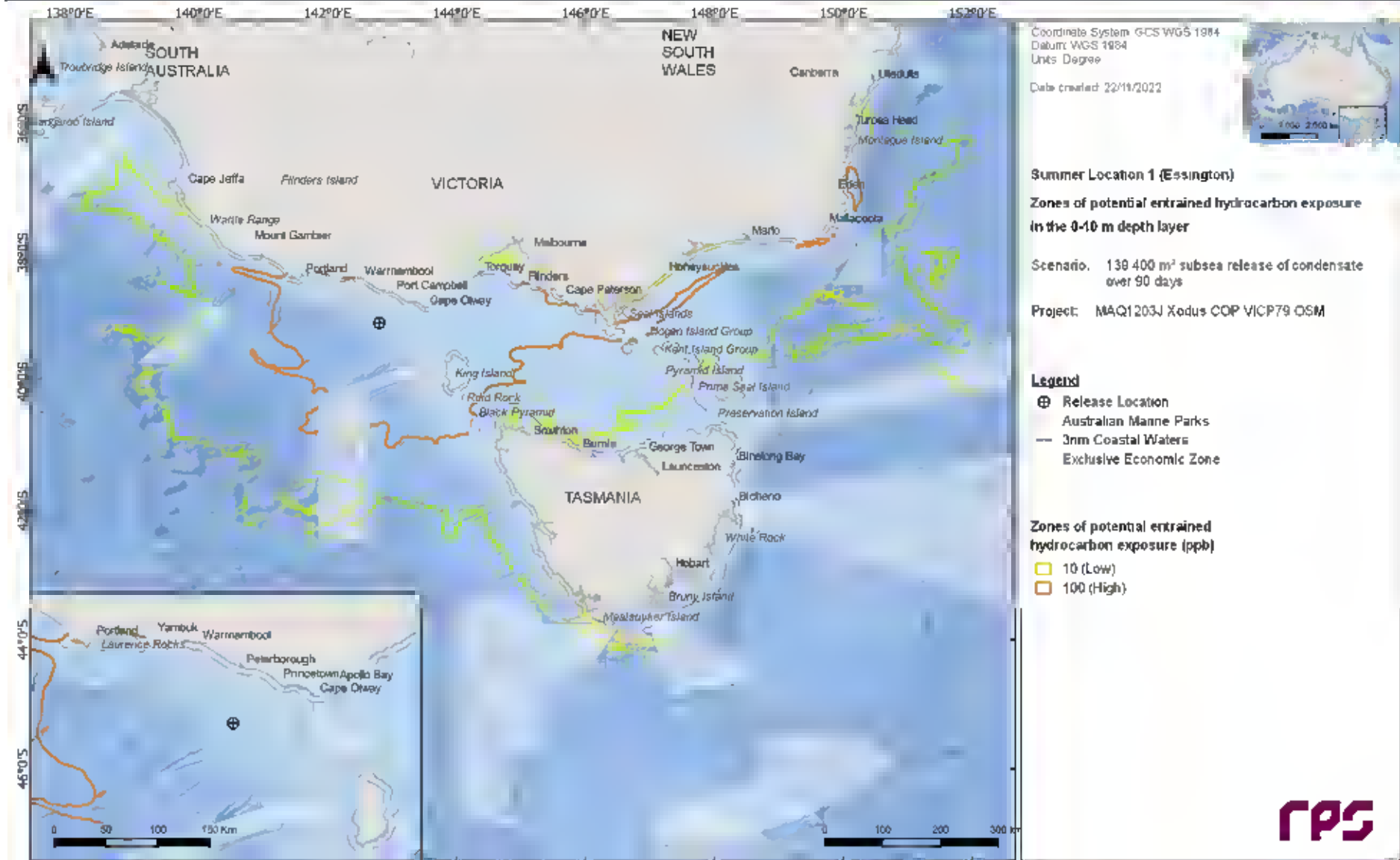


Figure 13.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

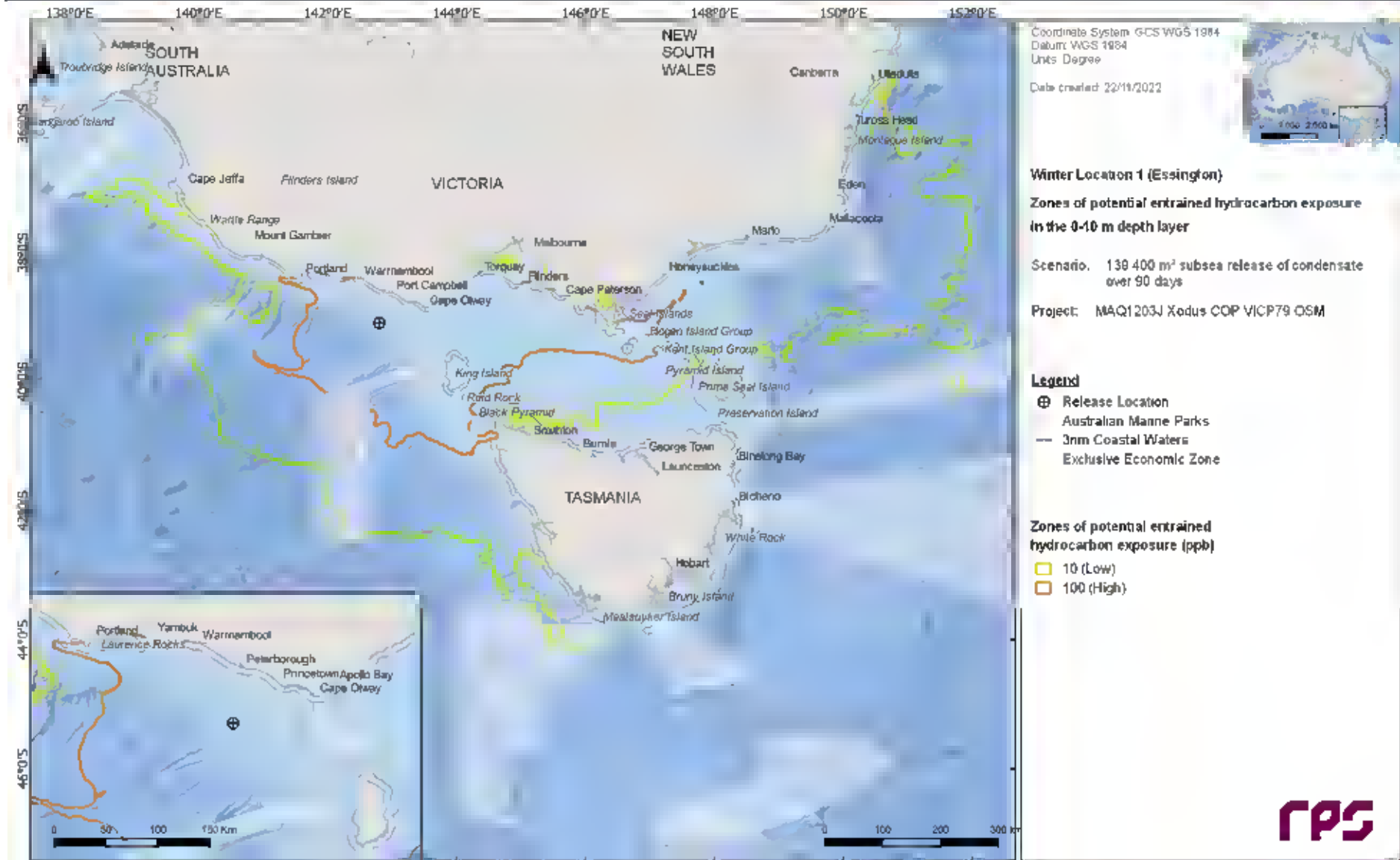


Figure 13.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

13.3 Deterministic Analysis

13.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 84 and commenced during winter conditions, 5 pm 9th April 2019.

Figure 13.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 16.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 13.11 and Figure 13.12, respectively.

Figure 13.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 78,140 m³ (~56%) was lost to the atmosphere through evaporation. Approximately, 59,630 m³ (~43%) of the released volume decayed, while approximately 1,430 m³ (~1%) was predicted to remain within the water column and approximately 20 m³ (~0.1%) was present on the shorelines.

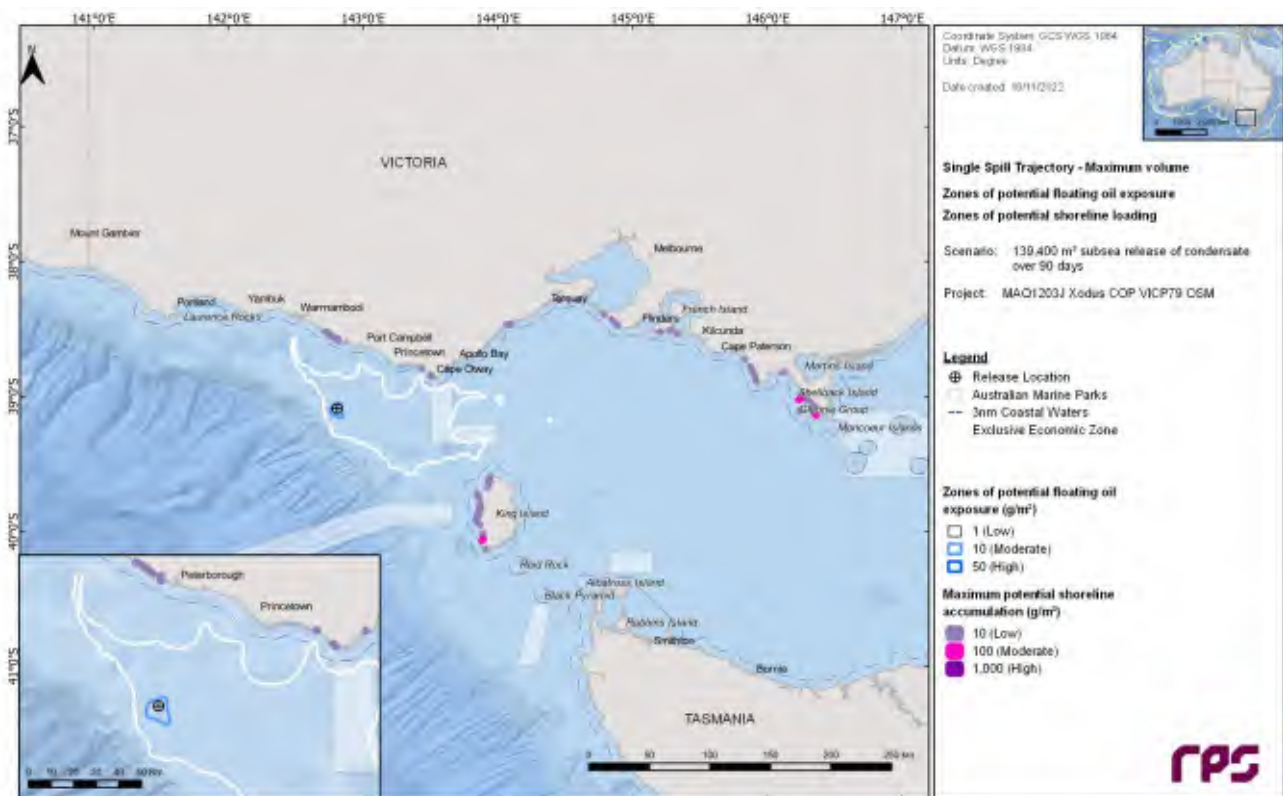


Figure 13.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

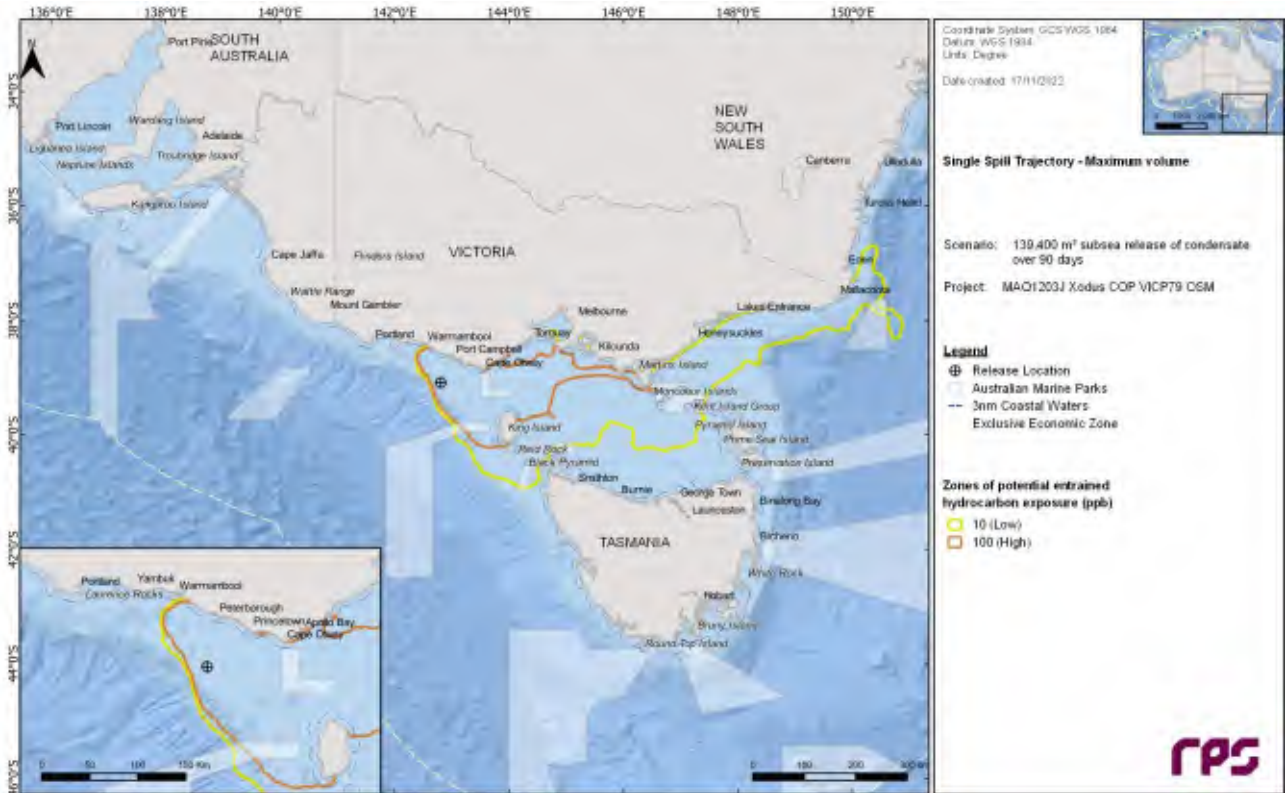


Figure 13.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

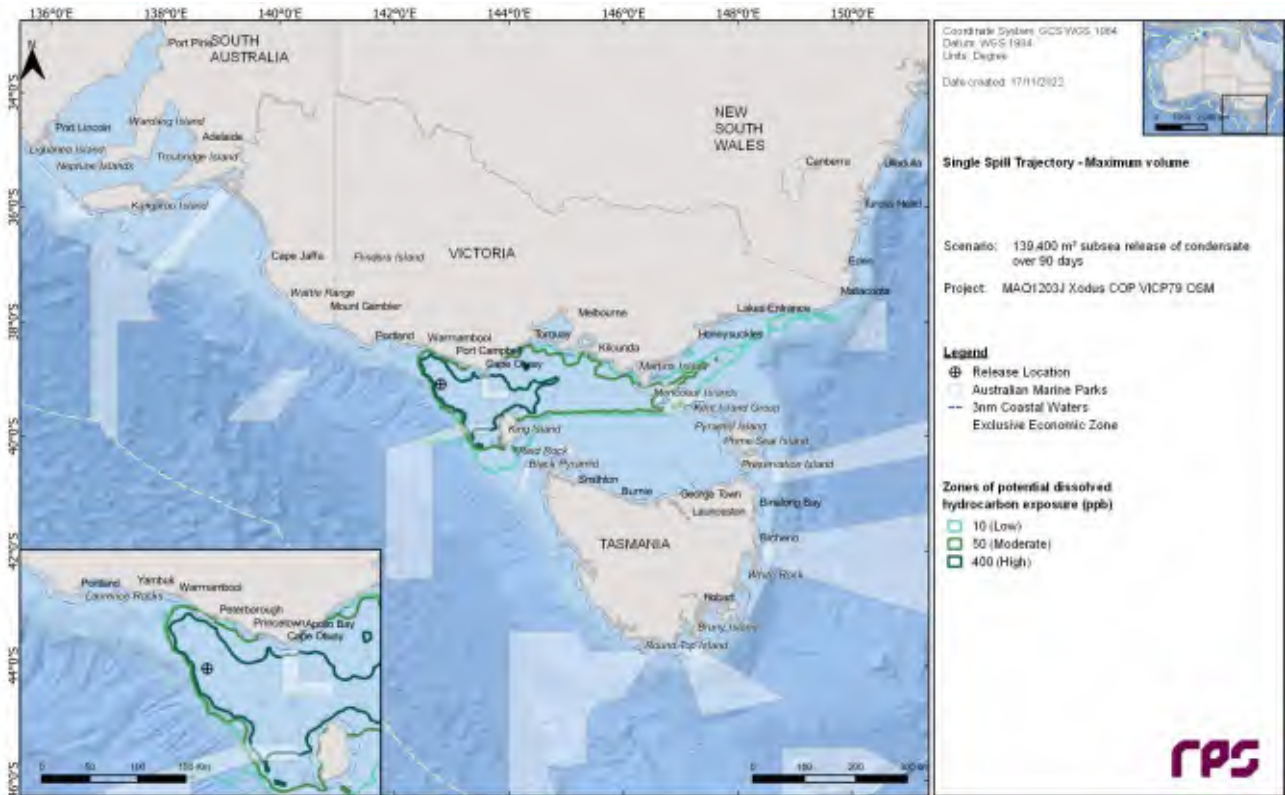


Figure 13.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

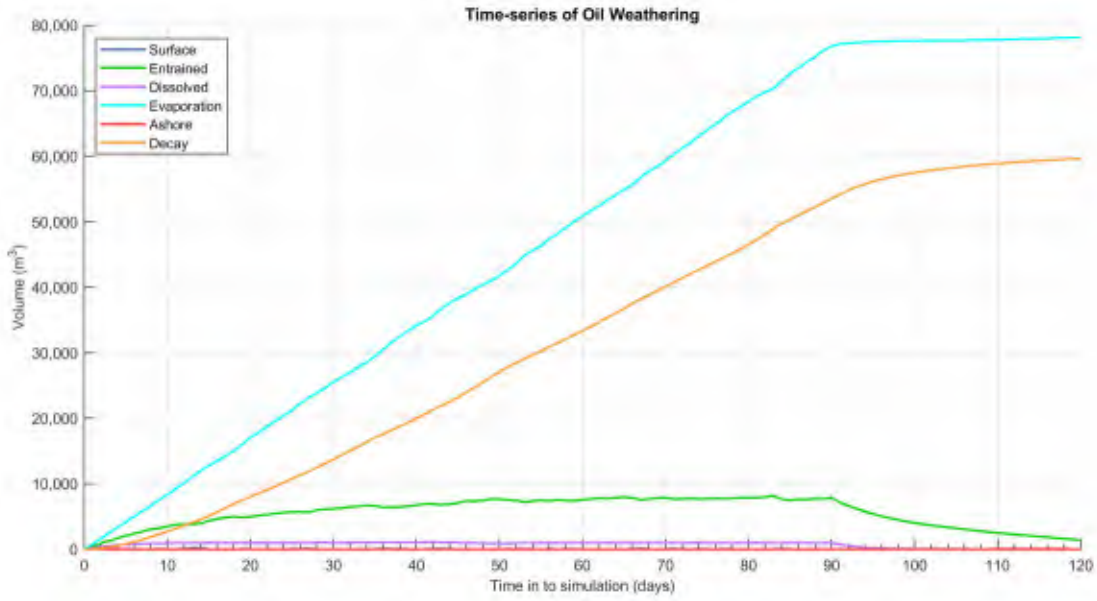


Figure 13.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 1.

14 LOCATION 2 LOWC RESULTS

This scenario examined the potential exposure following a subsea LOWC at Location 2. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 14.1 presents the EMBA, Section 14.2 shows the seasonal (or stochastic) results, while Section 14.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

14.1 EMBA

Figure 14.1 shows the EMBA for Location 2. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

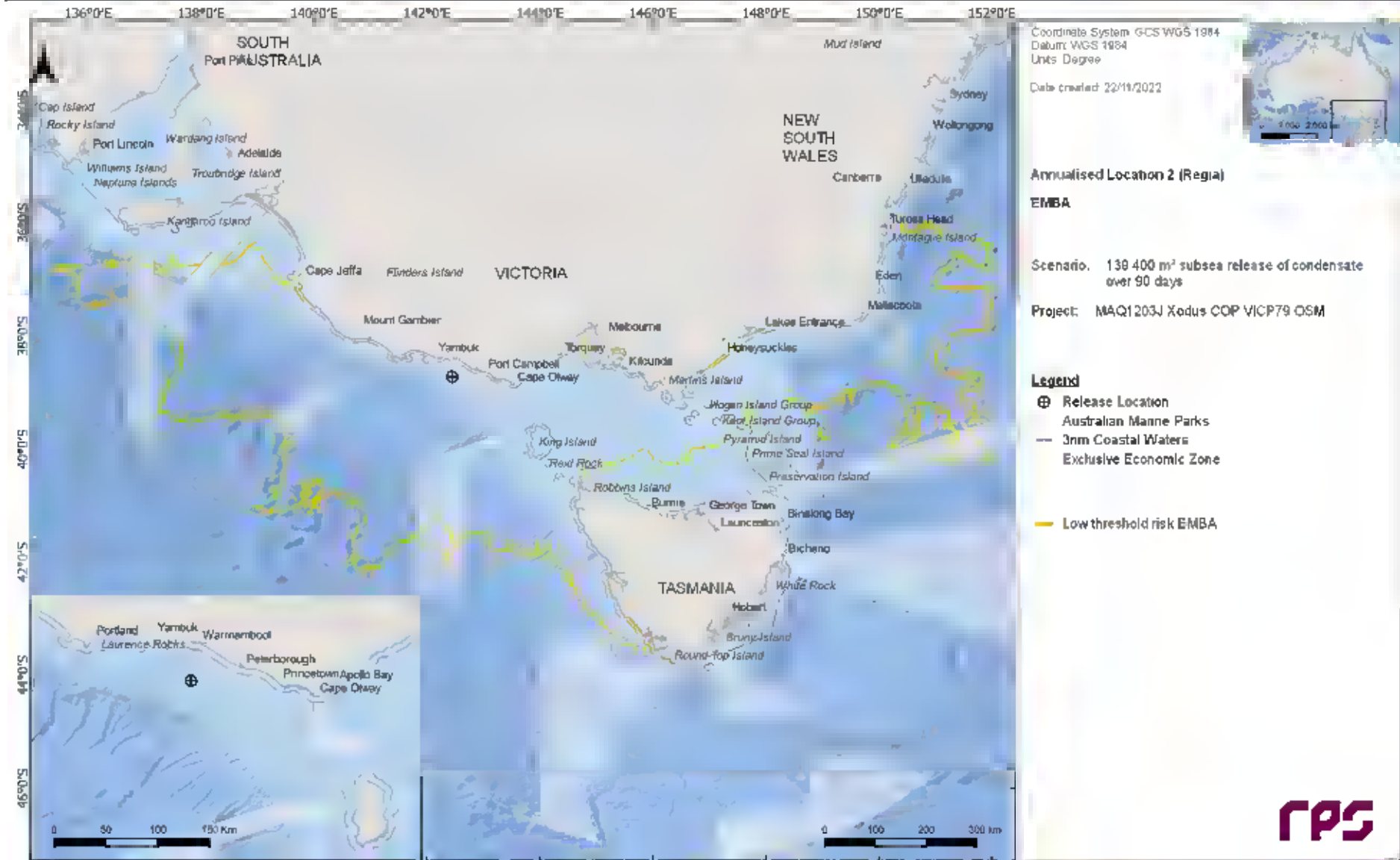


Figure 14.1 Predicted low threshold EMBA from a subsea LOWC at Location 2. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

14.2 Stochastic Analysis

14.2.1 Floating Oil Exposure

Table 14.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 14.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 14.2 to Figure 14.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 1,229 km² and 980 km², respectively.

Table 14.1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	179.2	11.1	-
	Maximum distance (km) from release location (99 th percentile)	112.6	10.1	-
	Direction	ESE	N	-
Winter	Maximum distance (km) from release location	342.1	10.1	0.4
	Maximum distance (km) from release location (99 th percentile)	151.9	9.5	0.4
	Direction	W	W	SE

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Table 14.2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 2 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter						
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	
AMP	Apollo	14	-	-	8.25	-	-	63	-	-	3.54	-	-
	Beagle	-	-	-	-	-	-	-	-	-	-	-	-
	Zeehan	-	-	-	-	-	-	-	-	-	-	-	-
IBRA	Bridgewater	2	-	-	16.63	-	-	1	-	-	75.25	-	-
	Gippsland Plain	-	-	-	-	-	-	1	-	-	49.46	-	-
	Glenelg Plain	2	-	-	16.75	-	-	2	-	-	62.38	-	-
	Otway Plain	37	-	-	5.5	-	-	91	-	-	4.17	-	-
	Otway Ranges	21	-	-	10.04	-	-	73	-	-	3.92	-	-
	Warrnambool Plain	58	-	-	4.88	-	-	95	-	-	3.58	-	-
	Wilson's Promontory	-	-	-	-	-	-	6	-	-	38.5	-	-
IMCRA	Central Bass Strait	15	-	-	3.88	-	-	63	-	-	2.71	-	-
	Central Victoria	19	-	-	14.79	-	-	66	-	-	2.21	-	-
	Flinders	-	-	-	-	-	-	6	-	-	38.5	-	-
	Otway	100	100	-	0.04	0.08	-	100	100	2	0.04	0.08	36.08
KEF	Bonney Coast Upwelling	30	-	-	3.46	-	-	18	-	-	4.38	-	-
MNP	Twelve Apostles	46	-	-	4.13	-	-	88	-	-	2.71	-	-
	Wilson's Promontory	-	-	-	-	-	-	5	-	-	38.5	-	-
MS	Merri	-	-	-	-	-	-	2	-	-	29.83	-	-
	The Arches	1	-	-	36.5	-	-	3	-	-	12.75	-	-
Nearshore Waters	Anser Island	-	-	-	-	-	-	5	-	-	38.58	-	-
	Bass Coast	-	-	-	-	-	-	1	-	-	49.46	-	-
	Colac Otway	38	-	-	5.5	-	-	92	-	-	3.92	-	-
	Corangamite	44	-	-	5.83	-	-	85	-	-	3.58	-	-
	Glenelg	2	-	-	16.63	-	-	2	-	-	62.38	-	-
	Kanowna Island	-	-	-	-	-	-	1	-	-	38.71	-	-
	Moyne	33	-	-	4.88	-	-	66	-	-	4.5	-	-

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	Norman Island	-	-	-	-	-	-	1	-	-	56.88	-	-
	South Gippsland	-	-	-	-	-	-	4	-	-	38.5	-	-
	Warrnambool	4	-	-	43.08	-	-	9	-	-	27.17	-	-
RSB	Bravenes Rock	1	-	-	38.63	-	-	4	-	-	2.42	-	-
State Waters	Victoria	97	-	-	2.38	-	-	100	-	-	2	-	-

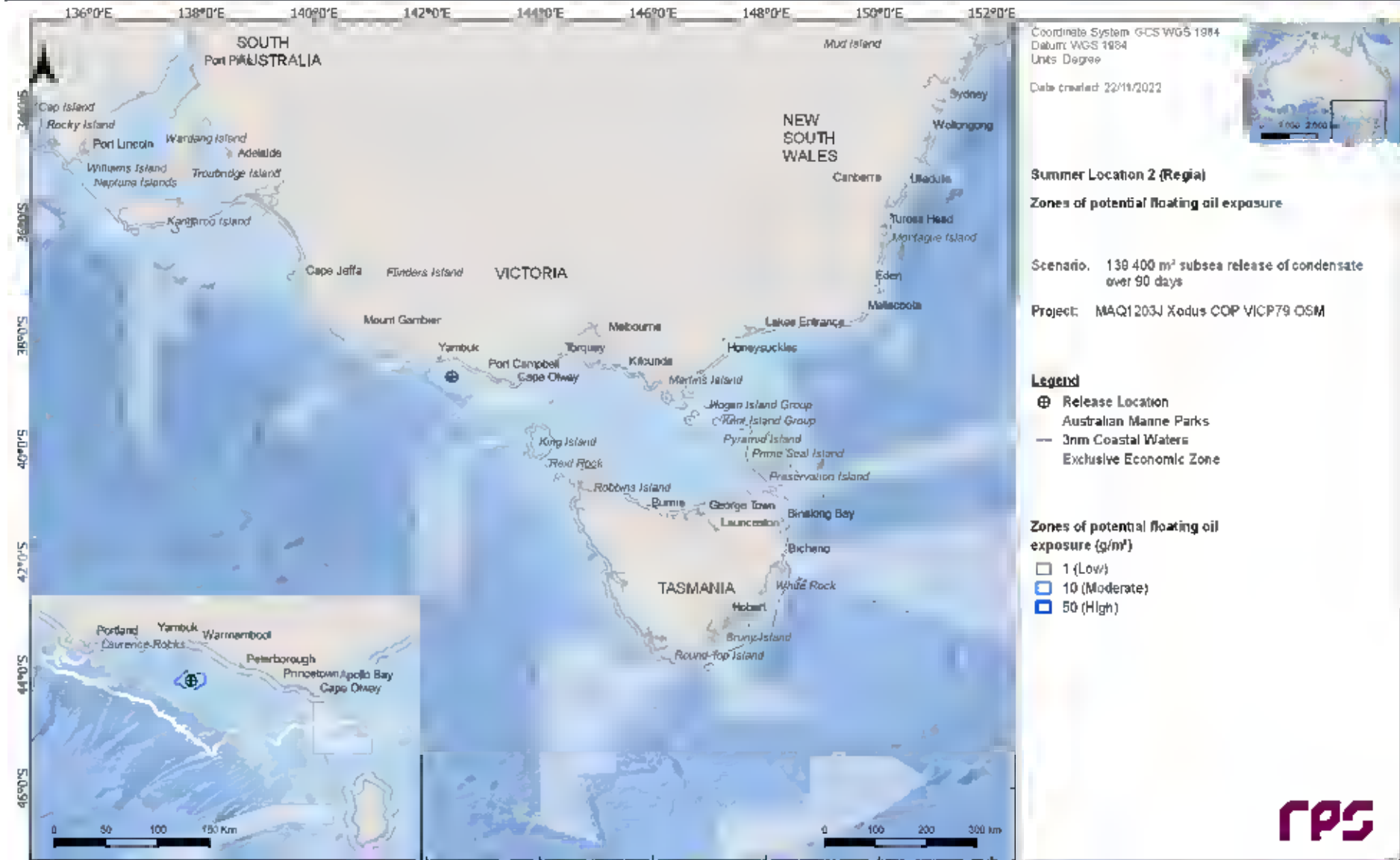


Figure 14.2 Zones of potential floating oil exposure from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

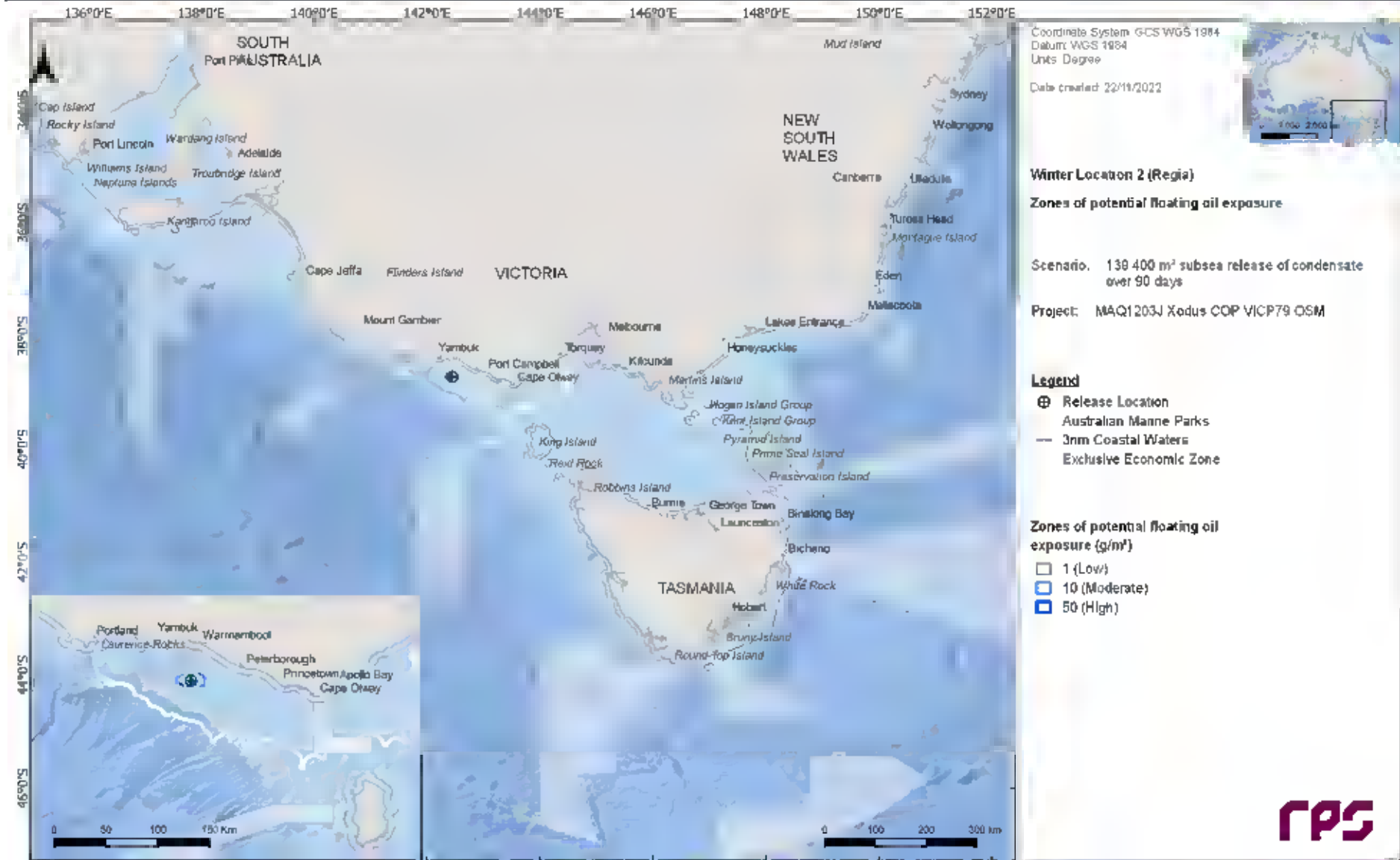


Figure 14.3 Zones of potential floating oil exposure from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.2.2 Shoreline Accumulation

Table 14.3 summarises the predicted accumulation on any shoreline during each season.

Table 14.4 and Table 14.5 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 14.4 and Figure 14.5.

Table 14.3 Summary of accumulation on any shoreline from a subsea LOWC at Location 2 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	100	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	4.21	3.63
Maximum volume of hydrocarbons ashore (m ³)	121.3	139.7
Average volume of hydrocarbons ashore (m ³)	26.9	47.1
Maximum length of the shoreline at 10 g/m² (km)	201	222
Average shoreline length (km) at 10 g/m² (km)	70.8	101.4
Maximum length of the shoreline at 100 g/m² (km)	47	35
Average shoreline length (km) at 100 g/m² (km)	8.4	15.4
Maximum length of the shoreline at 1,000 g/m² (km)	-	3
Average shoreline length (km) at 1,000 g/m² (km)	-	3

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Table 14.4 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 2 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	4	-	-	79.92	-	-	21	40	< 0.1	0.6	1.2	-	-	1.9	-	-
Bass Coast	6	-	-	26.46	-	-	14	22	< 0.1	0.9	1.3	-	-	1.9	-	-
Bega Valley	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Colac Otway	93	42	-	4.21	13.13	-	41	384	9.5	35.1	19.8	4.5	-	40.2	13.4	-
Corangamite	99	50	-	4.88	12.04	-	38	388	8.8	32.8	19.4	3.3	-	42.1	13.4	-
Curtis Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
East Gippsland	2	-	-	93.92	-	-	20	23	< 0.1	0.4	1	-	-	1	-	-
French Island	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Gabo Island	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Glenelg	49	9	-	5.46	9.54	-	25	301	2.1	35.2	11.7	3.4	-	45.9	10.5	-
Glennie Group	8	-	-	50.63	-	-	13	18	< 0.1	0.4	1.1	-	-	1.9	-	-
Grant	15	-	-	25.13	-	-	12	18	0.2	1.2	1.5	-	-	2.9	-	-
Greater Geelong	14	-	-	30.33	-	-	21	65	0.2	2.9	3.1	-	-	4.8	-	-
Hogan Island Group	1	-	-	103.21	-	-	13	13	0.2	0.2	1	-	-	1	-	-
Kanowna Island	4	-	-	82.17	-	-	19	40	< 0.1	0.7	1.2	-	-	1.9	-	-
Kent Island Group	-	-	-	-	-	-	-	-	< 0.1	0.3	-	-	-	-	-	-
King Island	8	-	-	27.21	-	-	13	17	0.2	2.5	3.2	-	-	11.5	-	-
Lady Julia Percy Island	34	2	-	5.58	23.67	-	36	155	0.2	1.8	1	1	-	1	1	-
Laurence Rocks	24	-	-	6.08	-	-	24	66	0.2	1.5	1.8	-	-	2.9	-	-
Moncoeur Islands	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Mornington Peninsula	14	-	-	33.42	-	-	16	30	0.2	1.6	2.3	-	-	4.8	-	-
Moyne	87	43	-	4.50	5.71	-	41	457	8.2	38.4	17.7	4.1	-	52.6	11.5	-
Norman Island	7	-	-	71.71	-	-	23	56	< 0.1	1.1	1.2	-	-	1.9	-	-
Phillip Island	12	-	-	27.54	-	-	14	23	0.1	1.3	2	-	-	5.7	-	-
Rodondo Island	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Seal Islands	2	-	-	94.08	-	-	14	17	< 0.1	0.2	1	-	-	1	-	-
Shellback Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-

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Skull Rock	4	-	-	82.17	-	-	22	40	< 0.1	0.6	1	-	-	1	-	-
South Gippsland	19	-	-	27.83	-	-	15	74	0.5	9	7.2	-	-	28.7	-	-
Surf Coast	14	1	-	27.67	92.96	-	16	119	0.4	18.3	4.5	1.9	-	25.8	1.9	-
Warrnambool	64	10	-	5.79	45.58	-	25	227	2.2	21.6	6.8	3.2	-	22	8.6	-

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Table 14.5 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 2 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	37	-	-	20.67	-	-	27	77	0.2	1.6	1.3	-	-	1.9	-	-
Bass Coast	26	-	-	16.17	-	-	18	71	0.4	3.4	3.1	-	-	8.6	-	-
Bega Valley	3	-	-	40.54	-	-	17	21	< 0.1	0.5	1.3	-	-	1.9	-	-
Colac Otway	100	74	-	4.33	5.04	-	48	729	14.7	51.1	27.3	4.9	-	48.8	13.4	-
Corangamite	99	70	1	3.63	5.25	89.38	62	1,250	21	73.7	28.8	7.9	2.9	49.7	22	2.9
Curtis Island	2	-	-	45.29	-	-	12	13	< 0.1	0.2	1	-	-	1	-	-
East Gippsland	10	-	-	24.33	-	-	16	33	< 0.1	0.6	1.2	-	-	1.9	-	-
French Island	3	-	-	91.96	-	-	15	16	< 0.1	0.4	1	-	-	1	-	-
Gabo Island	1	-	-	43.00	-	-	12	12	0.2	0.2	1	-	-	1	-	-
Glenelg	27	6	-	5.71	7.75	-	23	299	1	35.1	6.9	2.5	-	42.1	9.6	-
Glennie Group	42	-	-	17.33	-	-	17	59	0.4	2.2	3.3	-	-	7.6	-	-
Grant	1	-	-	95.92	-	-	12	14	< 0.1	1	1.9	-	-	1.9	-	-
Greater Geelong	12	-	-	32.38	-	-	16	57	0.2	2.7	2.7	-	-	5.7	-	-
Hogan Island Group	5	-	-	66.00	-	-	14	23	< 0.1	0.6	1.3	-	-	1.9	-	-
Kanowna Island	38	-	-	17.79	-	-	21	63	0.2	2.1	1.9	-	-	3.8	-	-
Kent Island Group	2	-	-	30.58	-	-	13	14	< 0.1	0.3	1	-	-	1	-	-
King Island	24	-	-	13.17	-	-	16	46	0.5	3	5.1	-	-	11.5	-	-
Lady Julia Percy Island	26	-	-	9.54	-	-	27	87	< 0.1	1	1	-	-	1	-	-
Laurence Rocks	25	-	-	5.63	-	-	23	83	0.2	1.5	1.8	-	-	2.9	-	-
Moncoeur Islands	12	-	-	26.75	-	-	19	44	0.1	1.4	2.2	-	-	3.8	-	-
Mornington Peninsula	36	-	-	12.08	-	-	16	63	0.5	2.5	3.3	-	-	10.5	-	-
Moyne	90	50	-	4.25	6.25	-	50	568	12	53.1	18.7	6.4	-	52.6	14.3	-
Norman Island	48	2	-	17.83	38.79	-	28	204	0.5	4.7	2.4	1.4	-	4.8	1.9	-
Phillip Island	34	3	-	9.67	89.71	-	18	150	0.4	4.6	2.6	1	-	9.6	1	-
Rodondo Island	14	-	-	45.33	-	-	25	62	< 0.1	0.7	1	-	-	1	-	-
Seal Islands	12	-	-	26.75	-	-	18	37	< 0.1	1	2	-	-	3.8	-	-
Shellback Island	21	-	-	19.33	-	-	28	60	< 0.1	0.7	1	-	-	1	-	-

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Skull Rock	38	-	-	17.79	-	-	22	63	0.2	1.4	1.6	-	-	2.9	-	-
South Gippsland	65	17	-	16.13	23.67	-	26	183	2.8	11.9	12.2	1.4	-	29.6	1.9	-
Surf Coast	27	2	-	14.58	47.67	-	16	124	0.7	18.8	4.9	2.9	-	32.5	3.8	-
Warrnambool	42	6	-	4.92	29.79	-	31	243	1.9	24.4	8	6.1	-	23.9	9.6	-

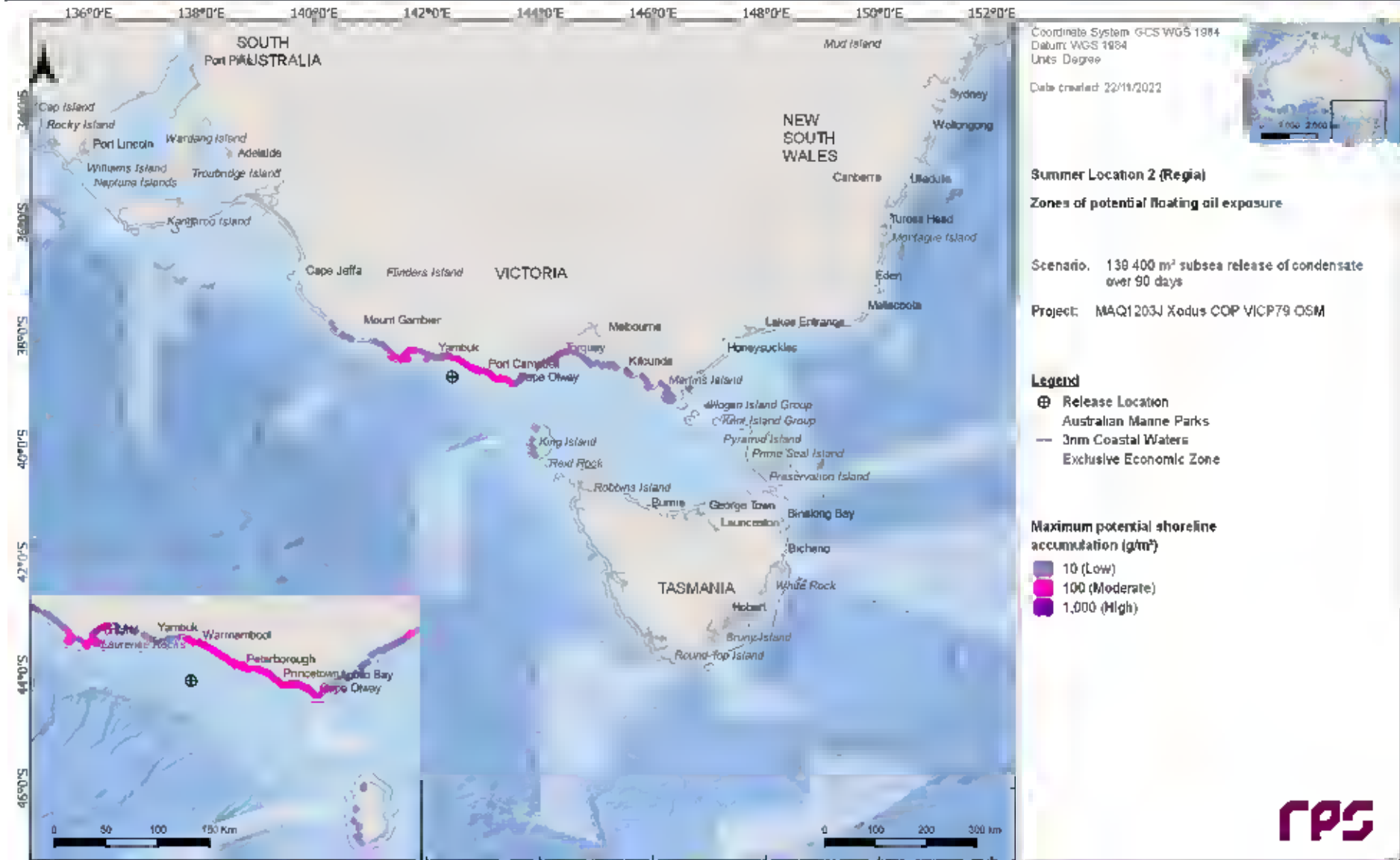


Figure 14.4 Maximum potential shoreline loading from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

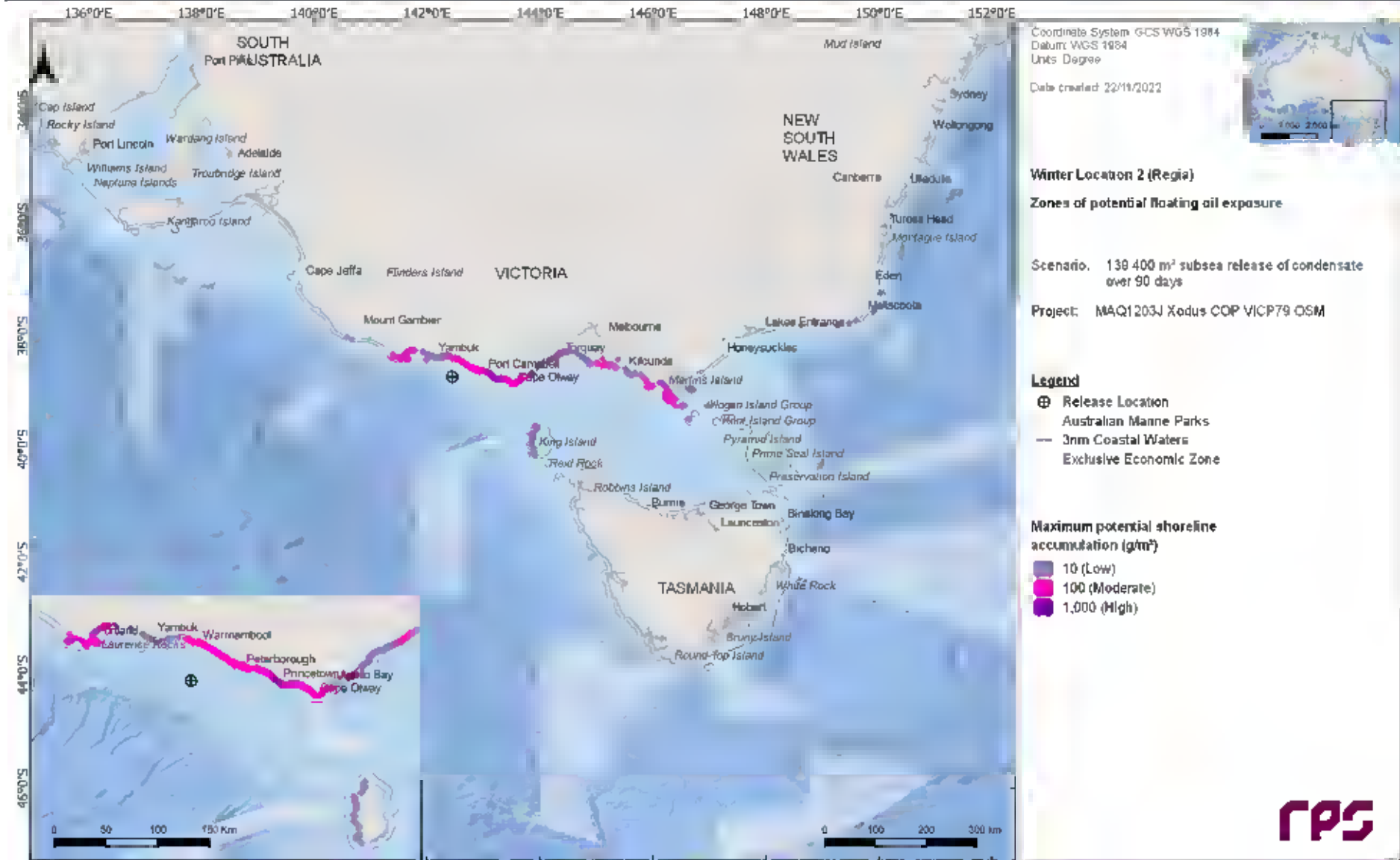


Figure 14.5 Maximum potential shoreline loading from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.2.3 In-water exposure

14.2.3.1 Dissolved Hydrocarbons

Table 14.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 14.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 14.6 and Figure 14.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 14.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	758	458	265
	Maximum distance (km) from release location (99 th percentile)	507	337	207
	Direction	ENE	E	E
Winter	Maximum distance (km) from release location	711	584	338
	Maximum distance (km) from release location (99 th percentile)	570	369	304
	Direction	ENE	E	E

Table 14.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Mod	High		Low	Mod	High	
AMP	Apollo	2,897	93	80	24	2,815	100	97	53
	Beagle	115	8	2	-	182	33	6	-
	Boags	10	-	-	-	35	2	-	-
	Franklin	42	3	-	-	40	2	-	-
	Murray	21	1	-	-	7	-	-	-
	Nelson	145	4	2	-	2	-	-	-
	Zeehan	650	56	28	1	475	20	10	1
IBRA	Bridgewater	781	42	18	1	304	8	4	-
	East Gippsland Lowlands	15	1	-	-	31	3	-	-
	Flinders	50	5	1	-	61	7	1	-
	Gippsland Plain	286	10	4	-	490	36	8	2
	Glenelg Plain	868	52	27	2	687	19	8	1
	King Island	51	7	1	-	126	7	1	-
	Otway Plain	2,607	95	89	31	2,042	100	100	63
	Otway Ranges	2,120	99	91	29	2,803	100	100	58
	Strzelecki Ranges	65	8	3	-	387	37	11	-
	Tasmanian West	6	-	-	-	35	1	-	-
	Warrnambool Plain	4,121	99	94	33	3,328	100	100	60
	Wilsons Promontory	203	12	5	-	684	38	9	1
	IMCRA	Batemans Shelf	10	1	-	-	17	1	-
Boags		16	1	-	-	23	2	-	-
Central Bass Strait		2,694	88	74	14	3,178	95	94	36
Central Victoria		3,259	91	78	18	2,923	100	95	47
Coorong		112	4	1	-	58	1	1	-
Flinders		283	14	6	-	1,168	42	12	2
Franklin		87	5	1	-	161	3	1	-
Otway		7,874	100	100	100	13,829	100	100	100
Twofold Shelf		130	7	2	-	156	13	2	-
Victorian Embayments		286	9	3	-	237	21	5	-
KEF	Bonney Coast Upwelling	1,884	83	77	30	2,187	63	53	20
	Upwelling East of Eden	46	4	-	-	57	4	1	-

REPORT

	West Tasmania Canyons	1,659	74	55	8	1,104	34	20	3
	Bunurong	41	8	-	-	118	30	3	-
	Cape Howe	19	1	-	-	16	1	-	-
	Churchill Island	35	3	-	-	69	3	1	-
	Discovery Bay	781	41	18	1	214	4	4	-
MNP	Ninety Mile Beach	5	-	-	-	12	1	-	-
	Point Addis	308	17	7	-	420	33	9	1
	Point Hicks	12	2	-	-	36	3	-	-
	Port Phillip Heads	56	5	1	-	206	12	2	-
	Twelve Apostles	3,682	99	96	48	2,705	100	100	66
	Wilsons Promontory	203	12	5	-	800	37	9	1
MP	Batemans	10	1	-	-	7	-	-	-
	Lower South East	54	9	1	-	36	2	-	-
	Beware Reef	6	-	-	-	19	1	-	-
MS	Marengo Reefs	612	71	41	4	871	98	83	8
	Merri	373	51	17	-	456	37	14	1
	Mushroom Reef	109	8	2	-	82	16	2	-
	The Arches	1,197	92	68	7	1,465	100	91	19
	Albatross Island	10	1	-	-	3	-	-	-
	Anser Island	149	12	1	-	394	37	6	-
	Bass Coast	179	6	3	-	175	20	4	-
	Bega Valley	8	-	-	-	18	1	-	-
	Black Pyramid	12	1	-	-	14	1	-	-
	Circular Head	47	1	-	-	35	1	-	-
	Colac Otway	2,607	97	89	31	2,556	100	100	63
	Corangamite	4,121	99	94	33	3,328	100	100	60
	Curtis Island	50	4	1	-	17	1	-	-
	East Gippsland	15	1	-	-	31	3	-	-
	French Island	24	1	-	-	142	5	1	-
	Gabo Island	8	0	-	-	17	1	-	-
Nearshore Waters	Glenelg	868	52	27	2	687	19	8	1
	Glennie Group	203	12	5	-	684	37	9	1
	Grant	75	4	1	-	27	1	-	-
	Greater Geelong	168	8	1	-	206	10	2	-
	Hogan Island Group	45	5	-	-	61	7	1	-
	Hunter Island	19	1	-	-	4	-	-	-
	Kanowna Island	149	11	1	-	394	38	6	-
	King Island	51	7	1	-	126	7	1	-
	Lady Julia Percy Island	781	66	40	4	536	45	26	1
	Laurence Rocks	435	52	28	1	875	25	8	1
	Moncoeur Islands	148	7	2	-	89	29	2	-
	Mornington Peninsula	153	10	3	-	307	29	5	-

REPORT

	Moyne	2,225	97	79	20	1,766	99	96	35
	Mud Island	10	-	-	-	33	5	-	-
	Norman Island	122	10	3	-	537	25	7	1
	Phillip Island	286	10	4	-	207	29	6	-
	Reid Rock	20	4	-	-	20	1	-	-
	Rodondo Island	101	8	1	-	162	34	5	-
	Seal Islands	22	1	-	-	43	7	-	-
	Shellback Island	61	10	2	-	340	24	7	-
	Skull Rock	92	11	1	-	394	38	7	-
	South Gippsland	133	10	3	-	490	37	11	2
	Surf Coast	300	18	8	-	386	44	11	-
	Three Hummock Island	11	1	-	-	1	-	-	-
	Warrnambool	772	70	38	3	1,331	66	40	5
	Wellington	11	1	-	-	57	3	1	-
	West Coast	5	-	-	-	29	1	-	-
NPS4	Bunurong Marine Park	107	5	2	-	129	18	4	-
	Corner Inlet Marine and Coastal Park	13	1	-	-	28	1	-	-
	Nooramunga Marine and Coastal Park	4	-	-	-	57	2	1	-
	Shallow Inlet Marine and Coastal Park	8	-	-	-	21	3	0	-
	Wilson's Promontory Marine Park	83	7	2	-	311	21	7	-
	Wilson's Promontory Marine Reserve	188	9	4	-	396	31	8	-
	Corner Inlet	13	1	-	-	57	2	1	-
Ramsar	Glenelg Estuary and Discovery Bay Wetlands	68	12	2	-	5	-	-	-
	Lavinia	18	1	-	-	5	-	-	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	91	4	1	-	199	4	2	-
	Western Port	67	3	1	-	184	6	2	-
	Bell Reef	13	3	-	-	13	1	-	-
RSB	Beware Reef	6	-	-	-	19	1	-	-
	Bravenes Rock	2,155	94	92	40	1,811	100	100	63
	Cody Bank	118	13	1	-	1,469	44	12	2
	Cutter Rock	40	4	-	-	52	8	1	-
	New Zealand Star Bank	12	1	-	-	11	1	-	-
	New South Wales	15	1	-	-	19	1	-	-

REPORT

State Waters	South Australia	84	9	1	-	78	2	1	-
	Tasmania	196	9	2	-	295	15	4	-
	Victoria	4,121	100	98	61	4,699	100	100	75

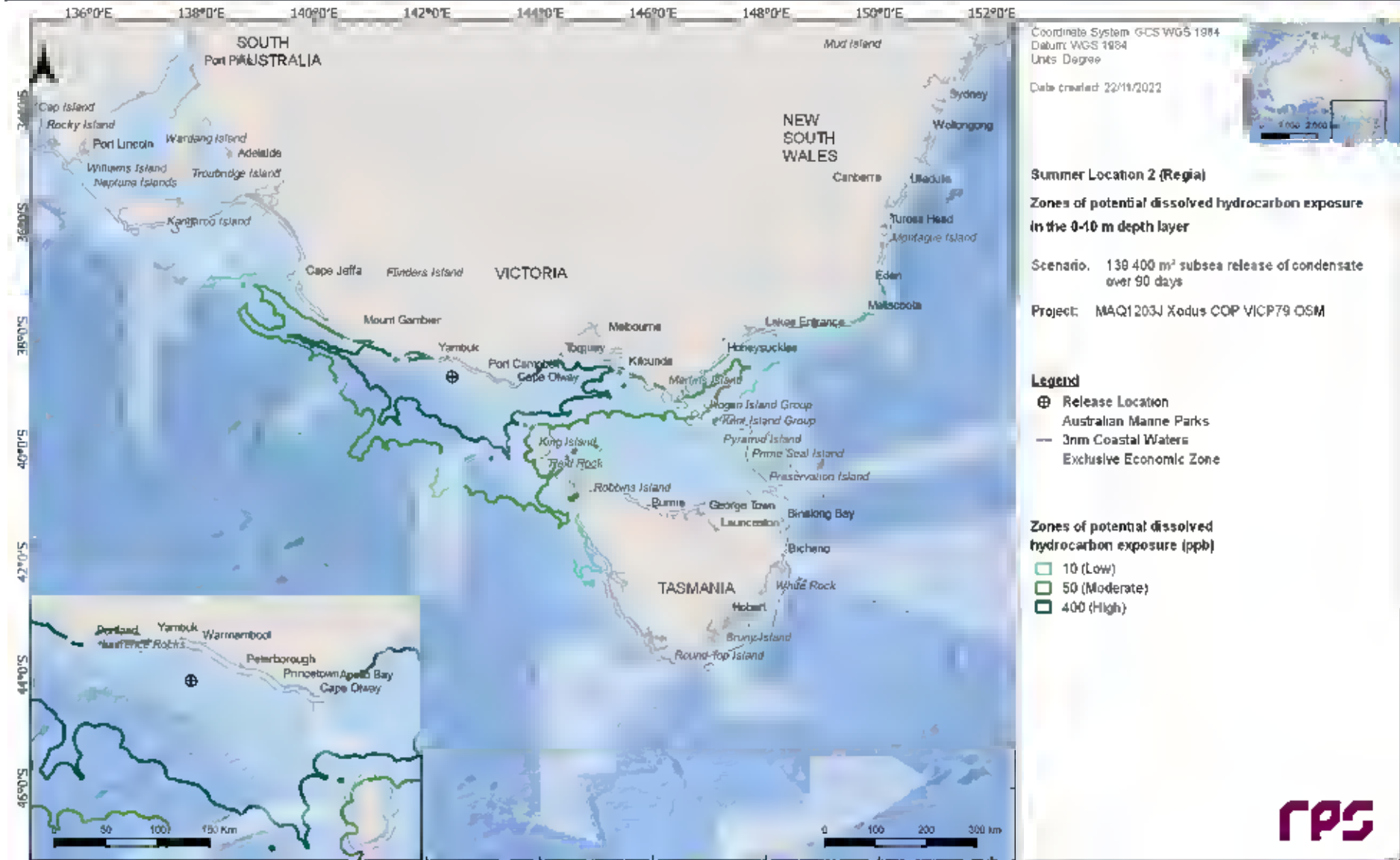


Figure 14.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

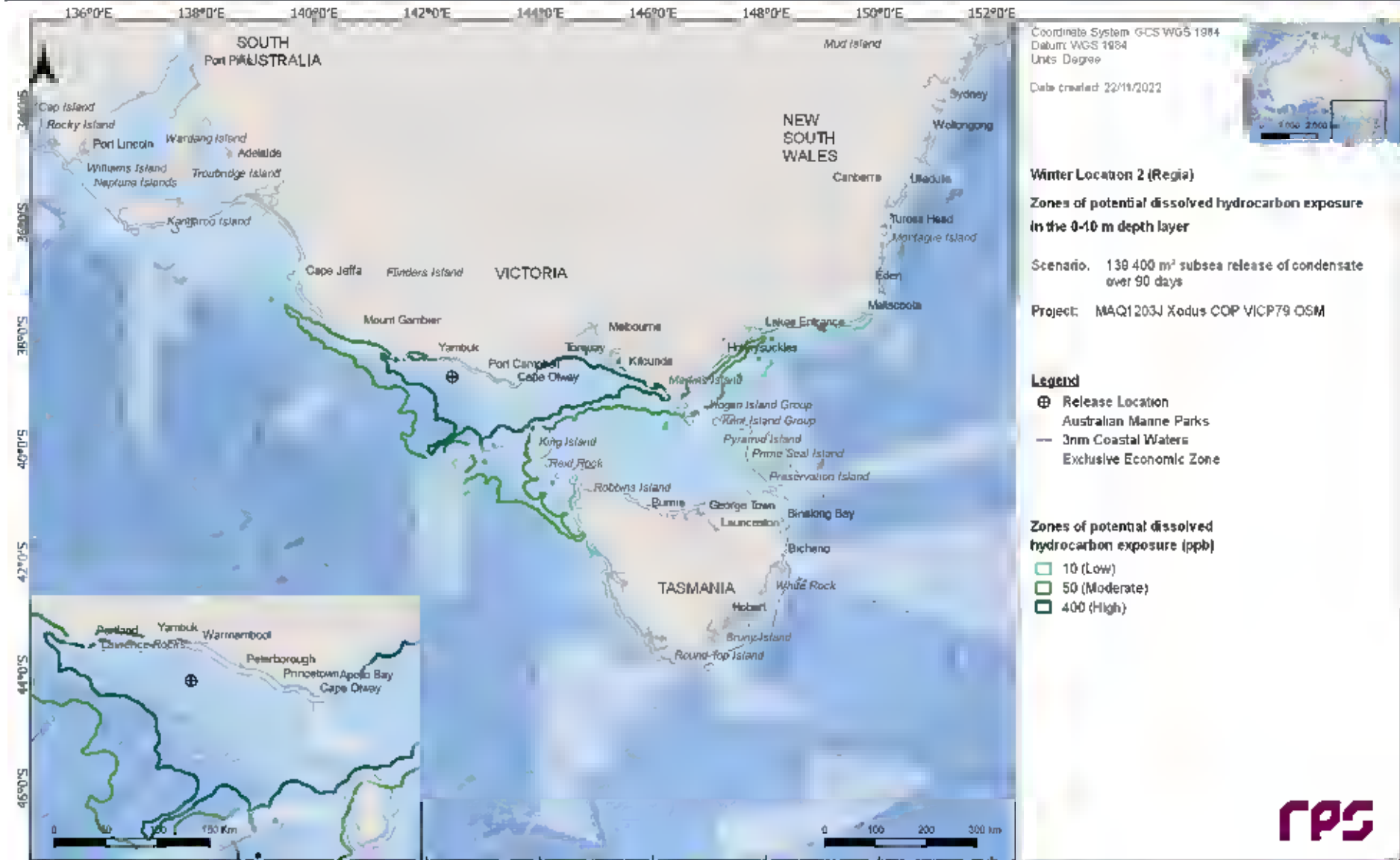


Figure 14.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.2.3.2 Entrained Hydrocarbons

Table 14.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 14.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 14.8 and Figure 14.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 14.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	879	437
	Maximum distance (km) from release location (99 th percentile)	819	375
	Direction	ENE	E
Winter	Maximum distance (km) from release location	856	477
	Maximum distance (km) from release location (99 th percentile)	822	396
	Direction	E	E

Table 14.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	1,035	98	89	1,408	100	100
	Beagle	183	43	3	187	77	30
	Boags	35	8	-	37	4	-
	East Gippsland	27	6	-	54	28	-
	Flinders	14	1	-	14	4	-
	Franklin	112	31	1	54	11	-
	Murray	28	14	-	8	-	-
	Nelson	125	15	3	53	1	-
	Zeehan	418	77	29	301	49	14
IBRA	Bateman	22	1	-	30	13	-
	Bridgewater	402	62	34	431	35	9
	East Gippsland Lowlands	52	22	-	52	55	-
	Flinders	121	32	2	133	69	4
	Gippsland Plain	193	48	5	336	86	26
	Glenelg Plain	548	69	48	831	41	24
	King Island	179	59	5	181	54	4
	Otway Plain	1,564	99	93	1,604	100	100
	Otway Ranges	1,112	99	98	1,217	100	100
	South East Coastal Ranges	10	1	-	19	8	-
	Strzelecki Ranges	94	46	-	199	80	11
	Tasmanian West	18	10	-	18	5	-
	Warrnambool Plain	2,365	100	99	2,472	100	100
	Wilsons Promontory	445	48	8	486	80	46
	IMCRA	Batemans Shelf	40	12	-	62	21
Boags		24	17	-	30	7	-
Central Bass Strait		1,062	94	81	1,225	100	95
Central Victoria		1,113	96	84	1,270	100	100
Coorong		108	28	1	29	2	-

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	Davey	18	4	-	4	-	-
	Flinders	476	50	9	487	80	46
	Franklin	44	33	-	62	9	-
	Otway	12,685	100	100	14,843	100	100
	Twofold Shelf	146	39	2	149	70	15
	Victorian Embayments	125	43	3	257	78	8
	Big Horseshoe Canyon	34	16	-	26	28	-
	Bonney Coast Upwelling	1,075	83	79	1,078	70	59
	Canyons on the eastern continental slope	45	8	-	36	7	-
KEF	Kangaroo Island Pool, canyons and adjacent shelf break, and Eyre Peninsula upwellings	13	1	-	1	-	-
	Shelf rocky reefs	27	5	-	37	11	-
	Upwelling East of Eden	86	30	-	79	65	-
	West Tasmania Canyons	619	89	61	581	55	27
	Albatross Island	16	14	-	12	2	-
	Anser Island	345	47	7	355	79	42
	Bass Coast	81	47	-	336	86	11
	Bega Valley	50	17	-	50	49	-
	Black Pyramid	68	26	-	45	10	-
	Circular Head	21	10	-	20	7	-
	Colac Otway	1,564	99	97	1,604	100	100
	Corangamite	2,365	100	99	2,472	100	100
	Curtis Island	98	32	-	95	43	-
Nearshore Waters	East Gippsland	52	22	-	52	54	-
	Eurobodalla	13	1	-	20	11	-
	Frankston	5	-	-	17	4	-
	French Island	31	26	-	106	50	2
	Gabo Island	48	17	-	51	55	0
	Glenelg	548	69	48	831	41	24
	Glennie Group	445	48	8	486	80	46
	Grant	111	46	5	60	2	-
	Greater Geelong	140	38	5	148	69	7

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Hogan Island Group	121	32	2	133	69	4
Hunter Island	14	6	-	15	3	-
Kanowna Island	345	47	6	332	79	43
Kent Island Group	77	16	-	35	29	-
King Island	179	59	5	181	54	4
Lady Julia Percy Island	814	80	61	815	60	47
Laurence Rocks	563	68	57	722	43	28
Moncoeur Islands	184	41	3	191	75	30
Montague Island	22	1	-	30	13	-
Mornington Peninsula	138	47	5	274	80	12
Moyne	2,170	100	87	2,315	100	92
Mud Island	64	35	-	67	57	-
Norman Island	394	44	6	434	79	39
Phillip Island	107	48	2	231	85	9
Pyramid Island	11	2	-	11	1	-
Reid Rock	43	47	-	46	27	-
Rodondo Island	204	43	2	199	75	30
Seal Islands	60	34	-	84	67	0
Shellback Island	198	43	4	237	79	25
Skull Rock	322	48	5	332	79	43
South Gippsland	337	46	5	363	84	41
Surf Coast	264	66	4	259	85	11
Three Hummock Island	11	1	-	8	-	-
Warrnambool	867	87	71	930	81	56
Wattle Range	39	27	-	16	1	-
Wellington	9	-	-	10	1	-
West Coast	18	10	-	15	4	-
Bunurong	76	53	-	217	87	11
Cape Howe	57	21	-	61	57	-
Churchill Island	91	39	-	67	62	-
Discovery Bay	289	61	29	229	29	2
French Island	8	-	-	23	8	0
Point Addis	303	61	9	311	83	24
Point Hicks	40	25	-	43	61	-
Port Phillip Heads	129	40	5	139	69	9

MNP

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	Twelve Apostles	2,365	100	99	2,549	100	100
	Wilson's Promontory	476	47	9	487	80	45
	Yaringa	3	-	-	11	2	-
MP	Batemans	28	1	-	38	13	-
	Lower South East	176	47	4	85	5	-
	Upper South East	12	2	-	9	-	-
MS	Beware Reef	21	5	-	20	19	-
	Marengo Reefs	358	94	68	499	100	85
	Merri	571	78	52	713	61	36
	Mushroom Reef	61	41	-	216	77	7
	The Arches	899	100	87	991	100	91
NP	Kent Group	77	14	0	44	27	-
NPS4	Bunurong Marine Park	59	43	0	316	85	10
	Corner Inlet Marine and Coastal Park	43	32	-	71	57	-
	Nooramunga Marine and Coastal Park	6	0	-	10	1	-
	Shallow Inlet Marine and Coastal Park	51	28	-	57	59	-
	Wilson's Promontory Marine Park	269	43	4	277	79	32
	Wilson's Promontory Marine Reserve	425	46	8	434	80	46
	Corner Inlet	43	32	-	71	57	-
Ramsar	Glenelg Estuary and Discovery Bay Wetlands	254	40	18	80	9	-
	Lavinia	22	8	-	9	0	-
	Piccaninnie Ponds Karst Wetlands	60	30	-	40	2	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	114	28	2	113	61	6
	Western Port	91	39	-	161	60	3
RSB	Bell Reef	49	50	-	58	25	-
	Beware Reef	21	5	-	20	19	-
	Bravenes Rock	1,130	99	97	909	100	100

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	Brown Rocks	10	1	-	9	-	-
	Cody Bank	104	57	1	143	86	15
	Cutter Rock	70	35	-	109	69	1
	New Zealand Star Bank	64	30	-	63	63	-
	New South Wales	61	21	-	67	53	-
State Waters	South Australia	185	49	5	86	5	-
	Tasmania	286	60	9	199	69	15
	Victoria	2,365	100	100	2,549	100	100

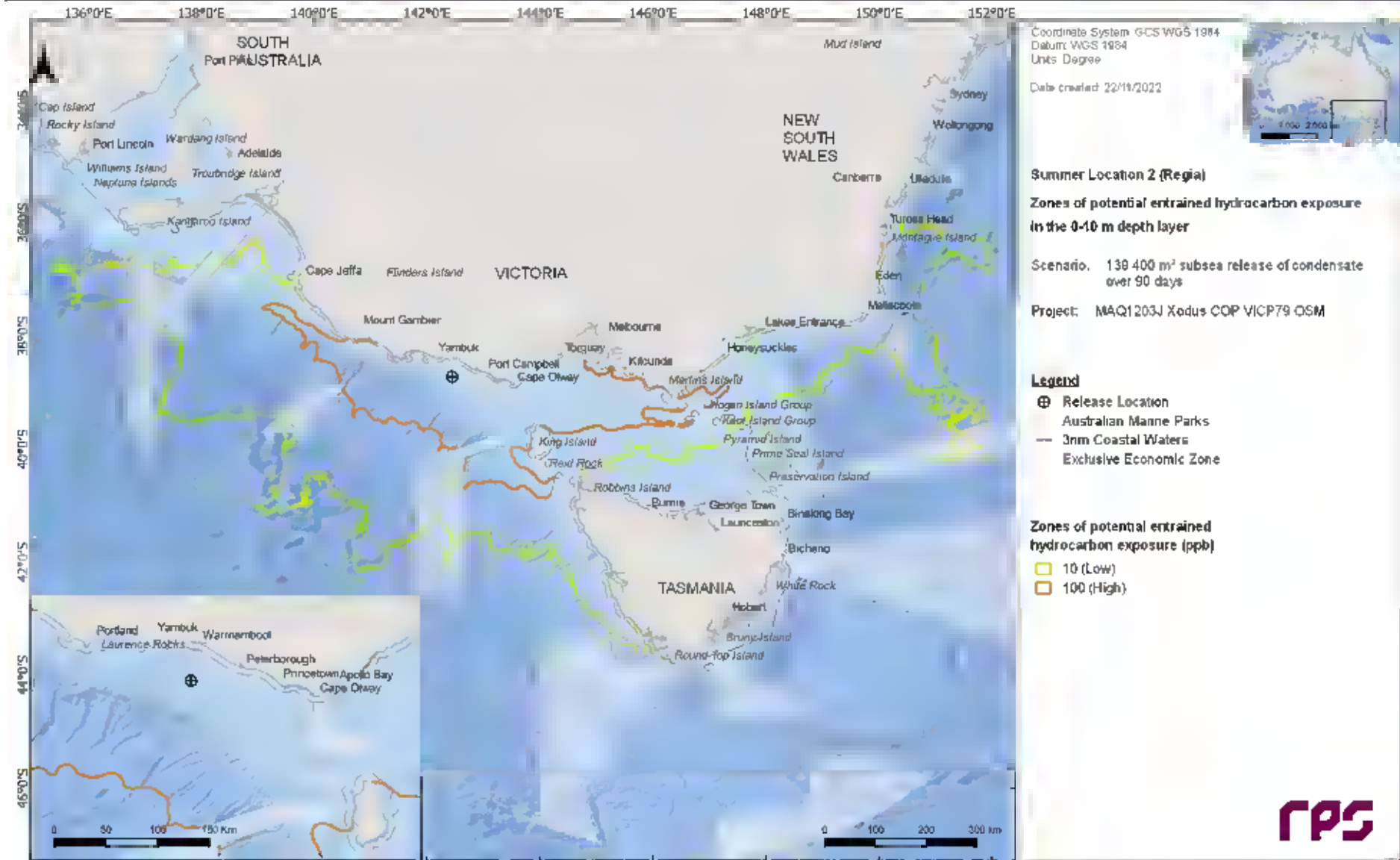


Figure 14.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

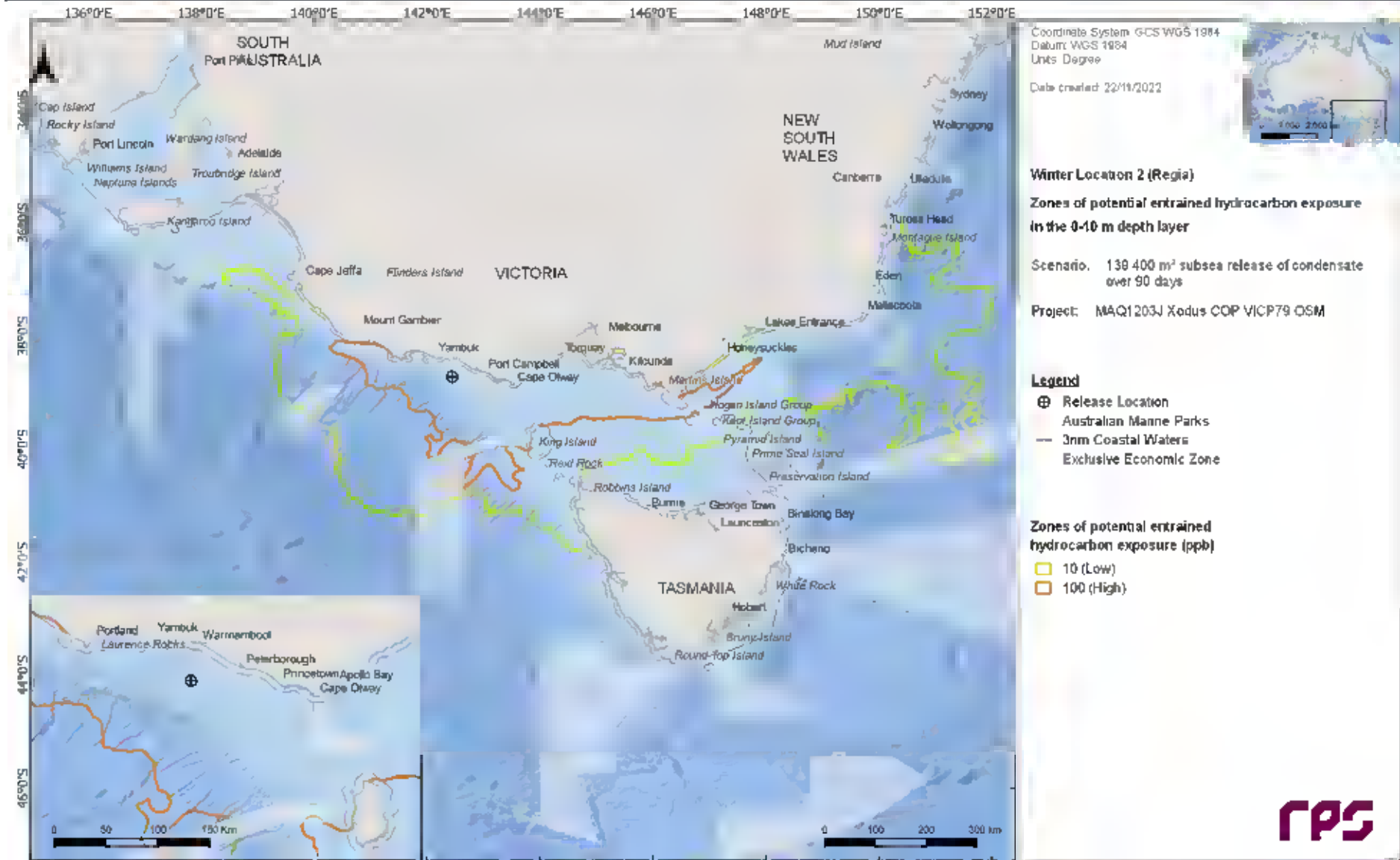


Figure 14.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

14.3 Deterministic Analysis

14.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 2 pm 5th July 2010.

Figure 14.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 11.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 14.11 and Figure 14.12, respectively.

Figure 14.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 75,660 m³ (~54%) was lost to the atmosphere through evaporation. Approximately, 61,600 m³ (~44%) of the released volume decayed, while approximately 2,055 m³ (~1%) was predicted to remain within the water column and approximately 97 m³ (<0.1%) was present on the shorelines.

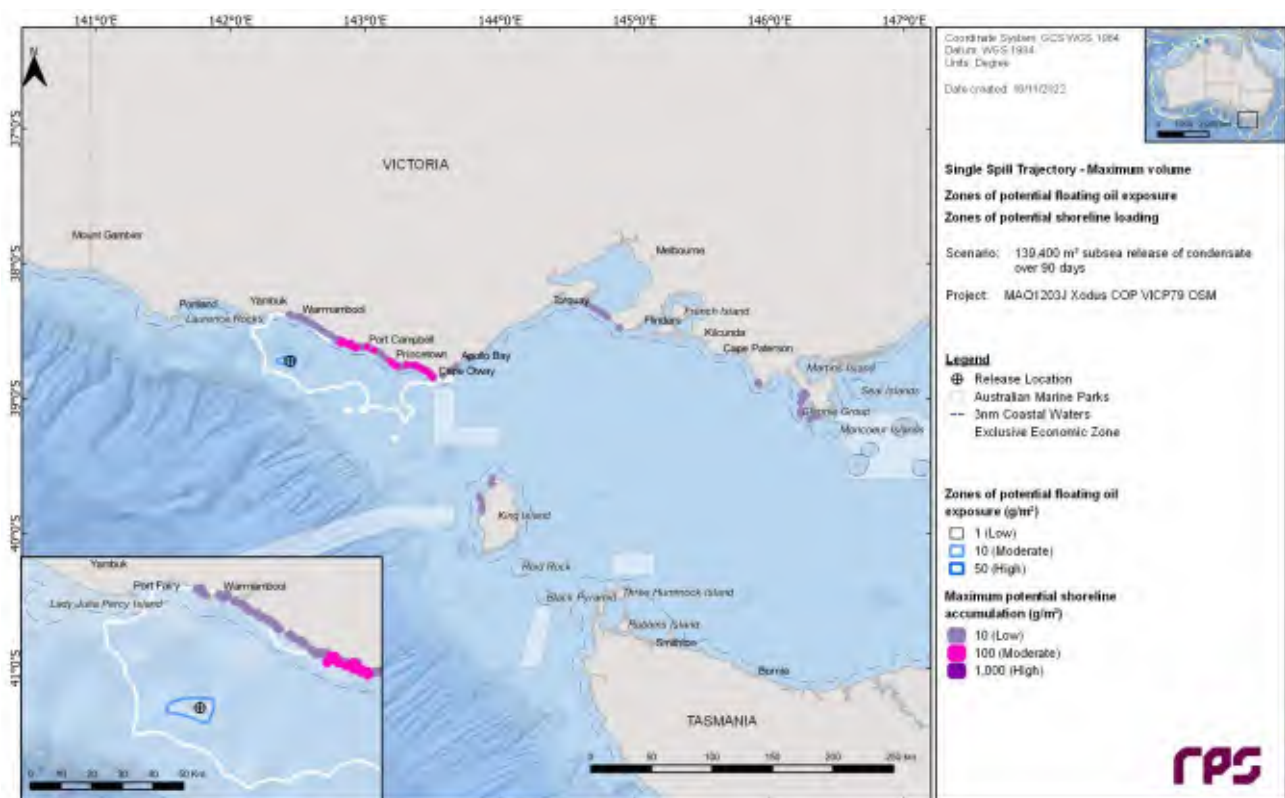


Figure 14.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

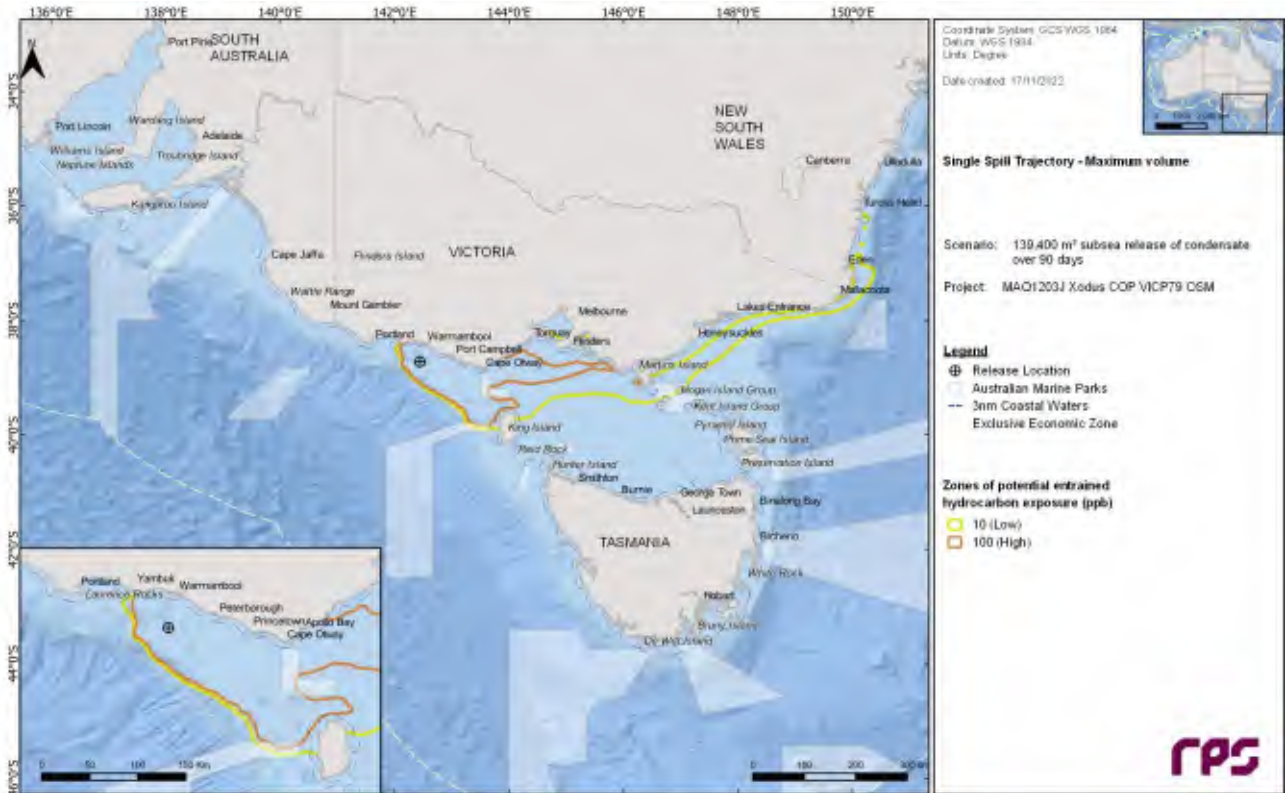


Figure 14.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

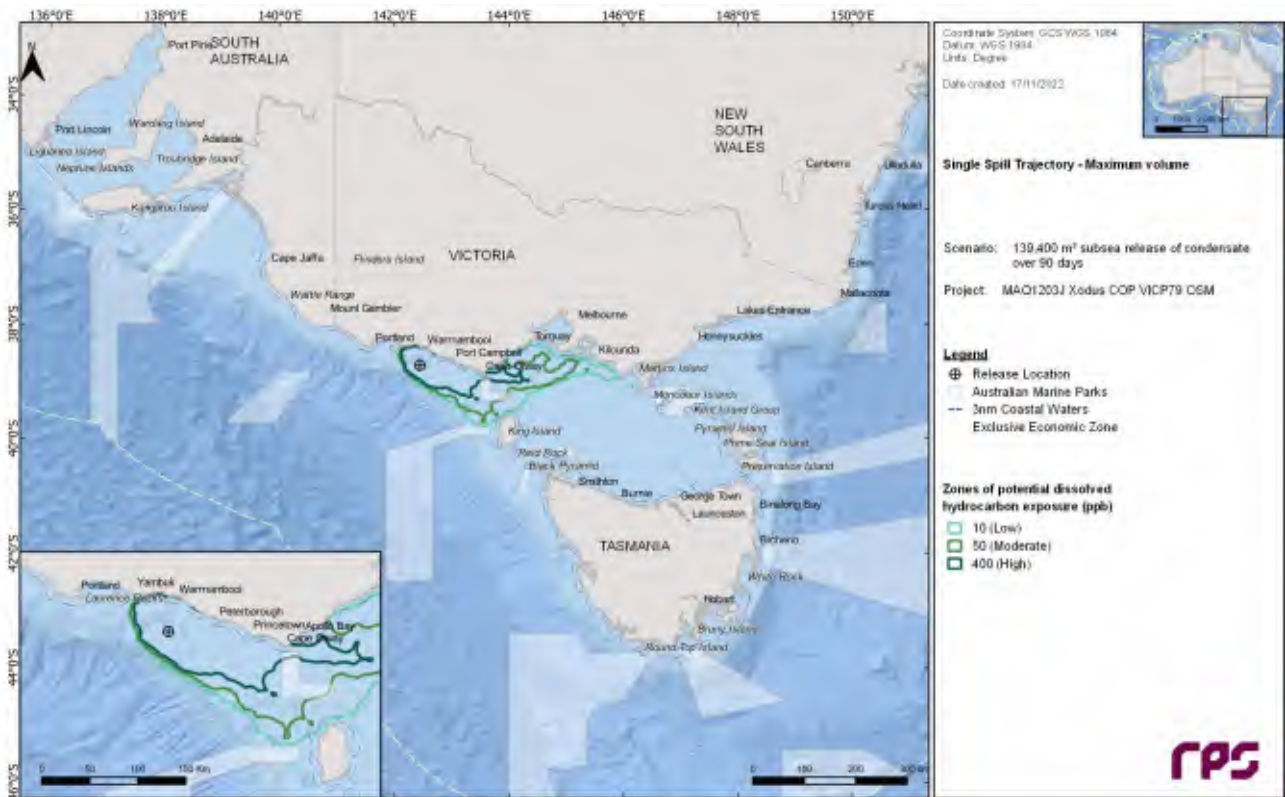


Figure 14.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

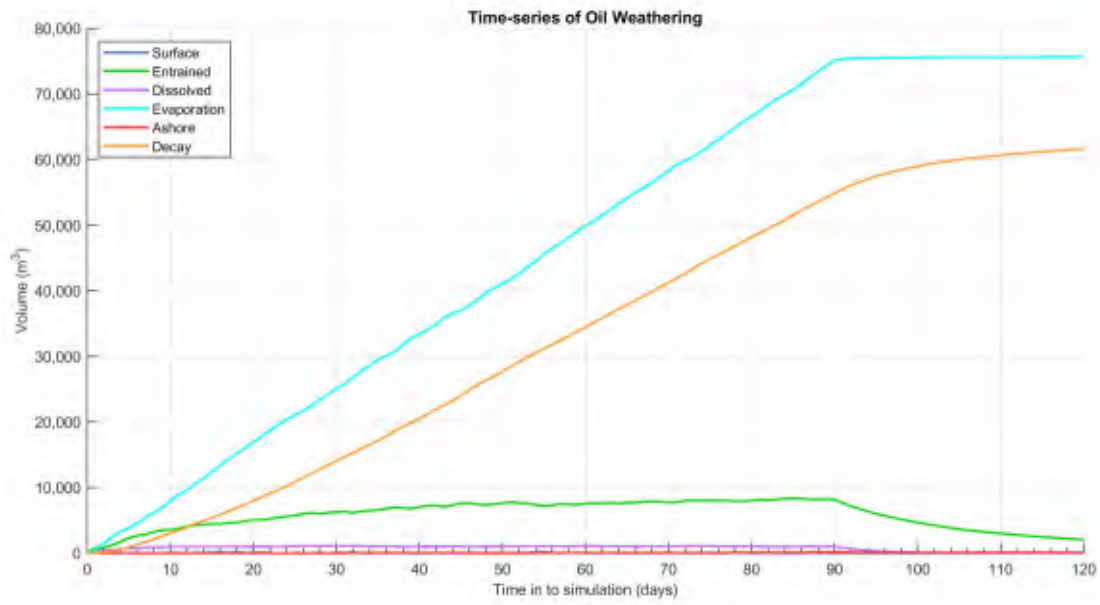


Figure 14.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 2.

15 LOCATION 3 LOWC RESULTS

This scenario examined the potential exposure following a LOWC at Location 3. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 15.1 presents the EMBA, Section 15.2 shows the seasonal (or stochastic) results, while Section 15.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

15.1 EMBA

Figure 15.1 shows the EMBA for Location 3. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

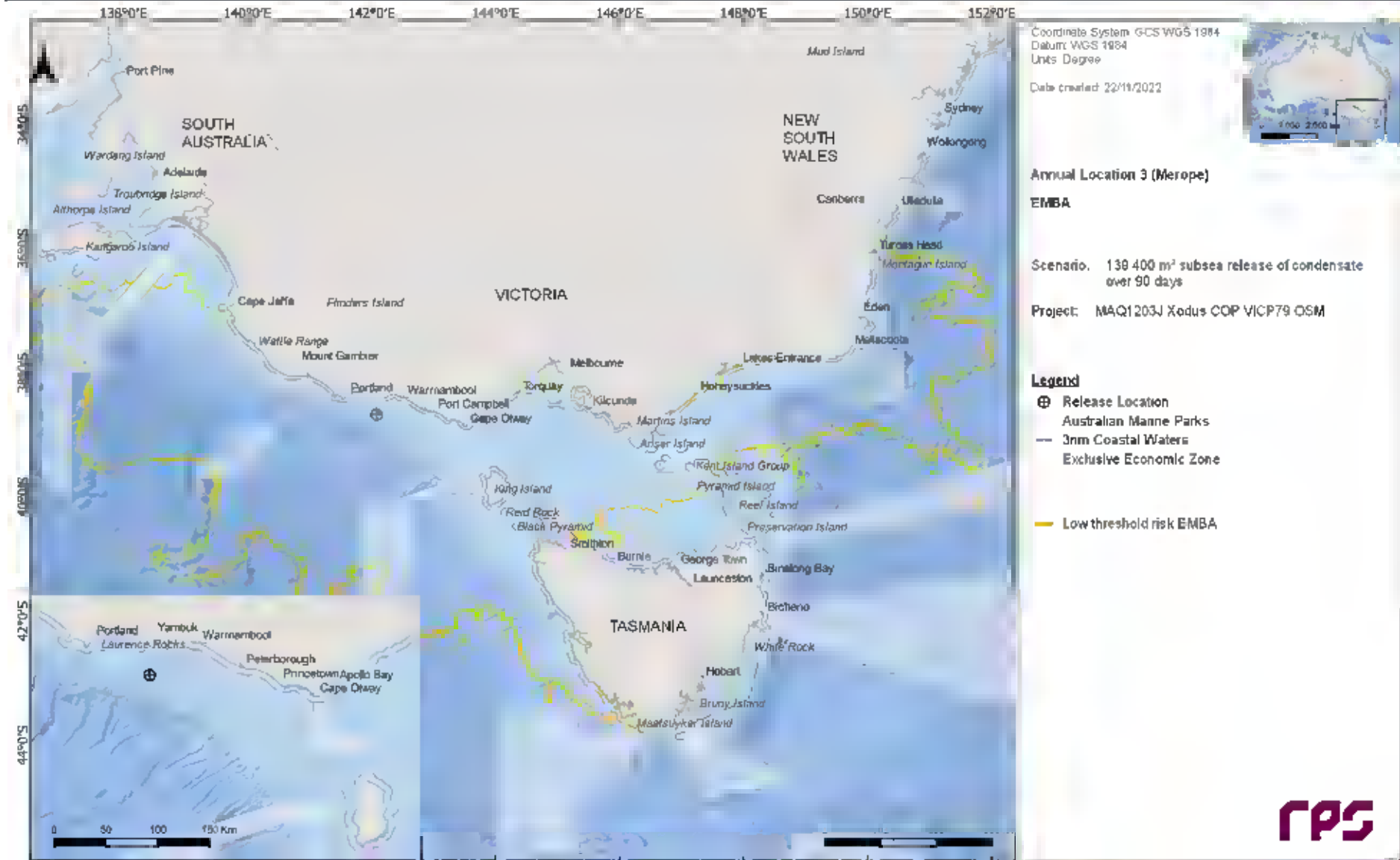


Figure 15.1 Predicted low threshold EMBA from a subsea LOWC at Location 3. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

15.2 Stochastic Analysis

15.2.1 Floating Oil Exposure

Table 15.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 15.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 15.2 to Figure 15.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 1,325 km² and 1,070 km², respectively.

Table 15.1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	175.7	10.1	0.4
	Maximum distance (km) from release location (99 th percentile)	118.8	9.7	0.4
	Direction	E	ENE	NE
Winter	Maximum distance (km) from release location	165.2	10.1	0.4
	Maximum distance (km) from release location (99 th percentile)	124.9	8.7	0.3
	Direction	E	E	E

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Table 15.2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 3 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter						
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	
AMP	Apollo	7	-	-	3.92	-	-	49	-	-	2.83	-	-
	Beagle	-	-	-	-	-	-	-	-	-	-	-	-
	Zeehan	-	-	-	-	-	-	-	-	-	-	-	-
IBRA	Bridgewater	7	-	-	11.92	-	-	13	-	-	7.92	-	-
	Gippsland Plain	-	-	-	-	-	-	3	-	-	57.58	-	-
	Glenelg Plain	9	-	-	11	-	-	18	-	-	7.67	-	-
	King Island	-	-	-	-	-	-	-	-	-	-	-	-
	Otway Plain	12	-	-	15.54	-	-	50	-	-	5.63	-	-
	Otway Ranges	7	-	-	20.42	-	-	28	-	-	10.67	-	-
	Strzelecki Ranges	-	-	-	-	-	-	-	-	-	-	-	-
	Warrnambool Plain	45	-	-	2.75	-	-	75	-	-	5.13	-	-
	Wilsons Promontory	-	-	-	-	-	-	4	-	-	28.54	-	-
	IMCRA	Central Bass Strait	5	-	-	4.71	-	-	47	-	-	3	-
Central Victoria		6	-	-	14.46	-	-	38	-	-	6.13	-	-
Flinders		-	-	-	-	-	-	7	-	-	28.54	-	-
Otway		100	100	1	0.04	0.08	67.46	100	100	1	0.04	0.08	11.13
Twofold Shelf		-	-	-	-	-	-	-	-	-	-	-	-
KEF	Bonney Coast Upwelling	84	-	-	3.38	-	-	78	-	-	1.46	-	-
	West Tasmania Canyons	5	-	-	8.58	-	-	12	-	-	3.42	-	-
MNP	Discovery Bay	1	-	-	31.79	-	-	-	-	-	-	-	-
	Twelve Apostles	22	-	-	6.92	-	-	74	-	-	9.13	-	-
	Wilsons Promontory	-	-	-	-	-	-	4	-	-	28.54	-	-
MS	Merri	-	-	-	-	-	-	-	-	-	-	-	-
	The Arches	1	-	-	26.58	-	-	6	-	-	12.96	-	-

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NPS4	Wilson's Promontory Marine Park	-	-	-	-	-	-	3	-	-	57.58	-	-
RSB	Bravenes Rock	-	-	-	-	-	-	1	-	-	23.75	-	-
	Anser Island	-	-	-	-	-	-	2	-	-	28.54	-	-
	Colac Otway	15	-	-	15.54	-	-	56	-	-	5.63	-	-
	Corangamite	34	-	-	5.04	-	-	69	-	-	5.71	-	-
	Glenelg	9	-	-	11	-	-	18	-	-	7.67	-	-
	Glennie Group	-	-	-	-	-	-	-	-	-	-	-	-
	Kanowna Island	-	-	-	-	-	-	-	-	-	-	-	-
	King Island	-	-	-	-	-	-	-	-	-	-	-	-
Nearshore Waters	Lady Julia Percy Island	5	-	-	9.33	-	-	4	-	-	33	-	-
	Laurence Rocks	3	-	-	11.33	-	-	3	-	-	52.42	-	-
	Mornington Peninsula	-	-	-	-	-	-	-	-	-	-	-	-
	Moyne	33	-	-	2.75	-	-	51	-	-	5.13	-	-
	Norman Island	-	-	-	-	-	-	-	-	-	-	-	-
	Shellback Island	-	-	-	-	-	-	-	-	-	-	-	-
	Skull Rock	-	-	-	-	-	-	-	-	-	-	-	-
	South Gippsland	-	-	-	-	-	-	5	-	-	35.08	-	-
	Warrnambool	3	-	-	49.5	-	-	9	-	-	9.04	-	-
State Waters	Tasmania	-	-	-	-	-	-	-	-	-	-	-	-
	Victoria	81	-	-	2.5	-	-	97	-	-	3	-	-

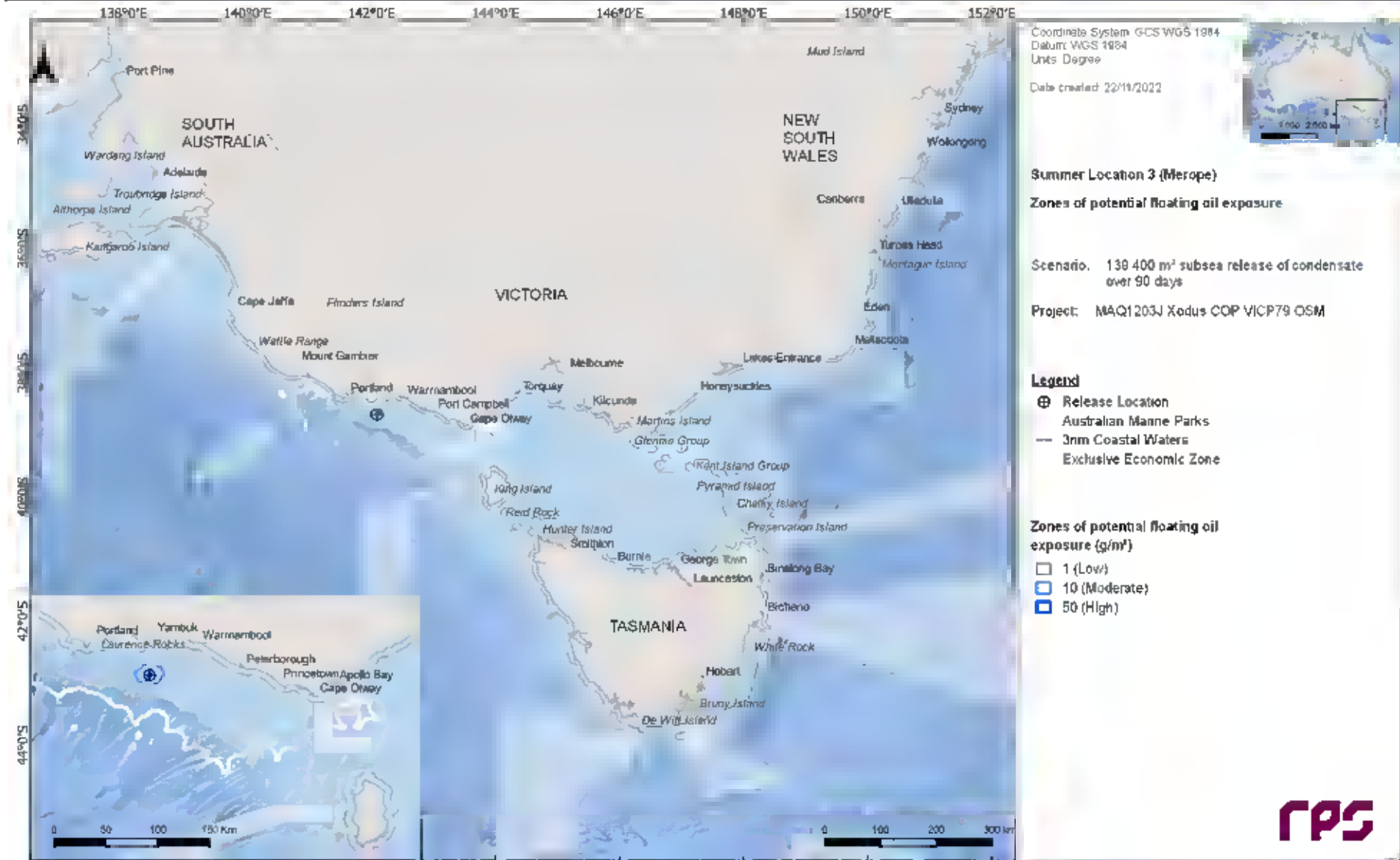


Figure 15.2 Zones of potential floating oil exposure from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

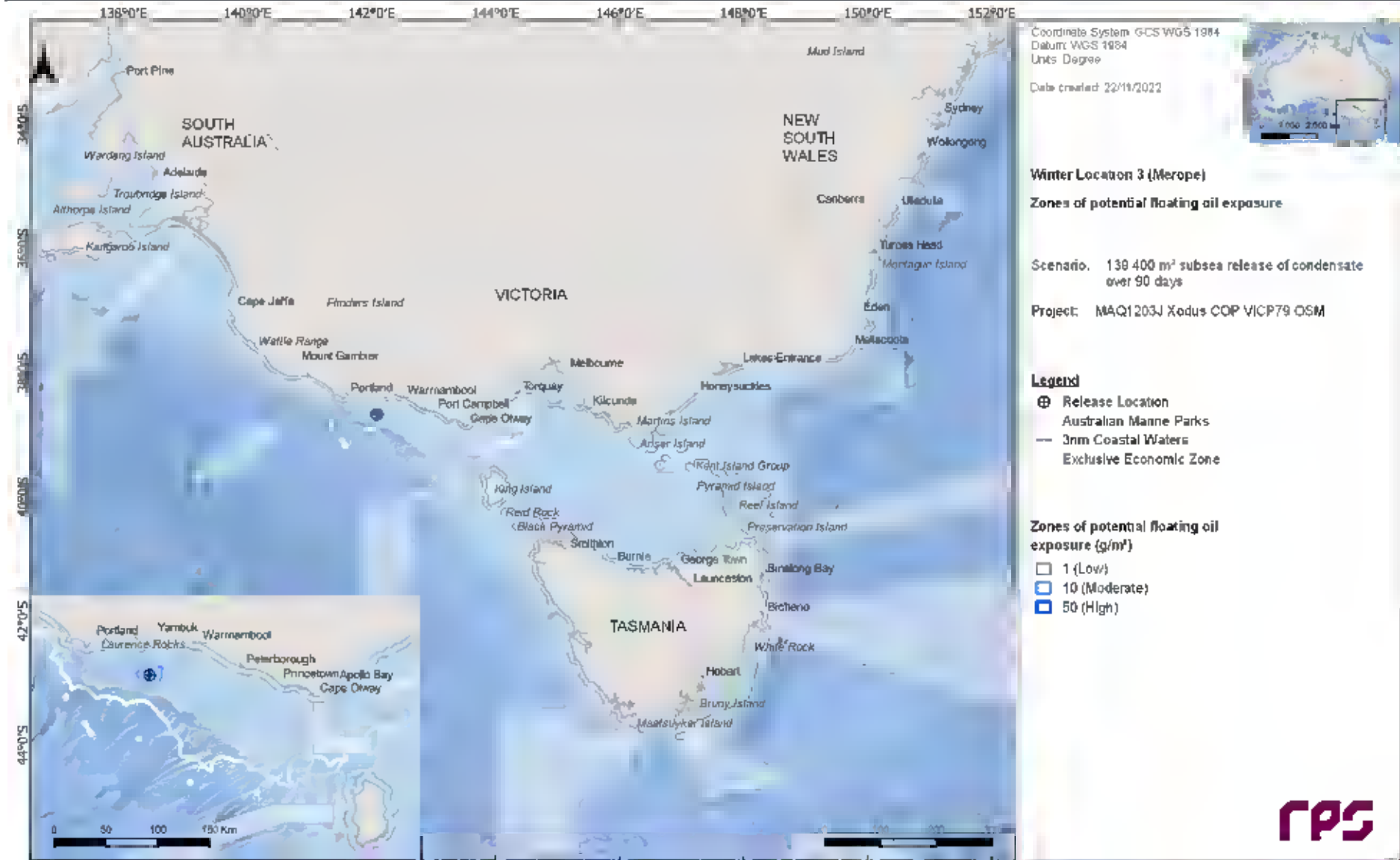


Figure 15.3 Zones of potential floating oil exposure from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.2.2 Shoreline Accumulation

Table 15.3 summarises the predicted accumulation on any shoreline during each season.

Table 15.4 and Table 15.5 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 15.4 and Figure 15.5.

Table 15.3 Summary of accumulation on any shoreline from a subsea LOWC at Location 3 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	100	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	3.79	4.04
Maximum volume of hydrocarbons ashore (m ³)	66.6	140.0
Average volume of hydrocarbons ashore (m ³)	13.7	33.7
Maximum length of the shoreline at 10 g/m² (km)	192	231
Average shoreline length (km) at 10 g/m² (km)	65.6	86.6
Maximum length of the shoreline at 100 g/m² (km)	20	42
Average shoreline length (km) at 100 g/m² (km)	5.4	10.7
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 15.4 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 3 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	5	-	-	46.5	-	-	23	35	< 0.1	0.4	1.3	-	-	1.9	-	-
Bass Coast	2	-	-	28.75	-	-	15	19	< 0.1	0.7	1.4	-	-	1.9	-	-
Colac Otway	83	25	-	6.54	12.92	-	30	279	4.6	22.6	14.9	2.5	-	44.9	4.8	-
Corangamite	83	35	-	5.29	8	-	35	444	3.9	25.9	18.1	2.4	-	39.2	10.5	-
Curtis Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
East Gippsland	3	-	-	51.96	-	-	12	16	< 0.1	0.6	1.6	-	-	1.9	-	-
French Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Glenelg	72	12	-	6.75	11.79	-	27	813	1.5	45.8	13.7	4.3	-	54.5	10.5	-
Glennie Group	6	-	-	46.54	-	-	15	20	< 0.1	0.5	1.3	-	-	1.9	-	-
Grant	16	-	-	20.13	-	-	14	46	< 0.1	0.8	3.2	-	-	9.6	-	-
Greater Geelong	6	-	-	31.54	-	-	15	22	< 0.1	0.6	1.9	-	-	5.7	-	-
Hogan Island Group	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Kanowna Island	4	-	-	43.29	-	-	19	29	< 0.1	1.4	1.9	-	-	2.9	-	-
Kent Island Group	-	-	-	-	-	-	-	-	< 0.1	0.2	-	-	-	-	-	-
King Island	16	4	-	27.75	79.46	-	20	184	0.9	7.8	4.7	1	-	9.6	1	-
Lady Julia Percy Island	55	3	-	9.08	9.46	-	39	203	0.1	0.7	1	1	-	1	1	-
Laurence Rocks	47	3	-	10.5	24.17	-	25	161	0.1	3.1	2.2	1	-	2.9	1	-
Moncoeur Islands	-	-	-	-	-	-	-	-	< 0.1	0.5	-	-	-	-	-	-
Mornington Peninsula	11	-	-	18.38	-	-	15	39	0.2	1.9	3	-	-	4.8	-	-
Moyne	96	23	-	3.79	4.42	-	32	544	2.6	29	14.7	5.1	-	47.8	12.4	-
Norman Island	5	-	-	45.25	-	-	22	46	< 0.1	0.8	1.7	-	-	2.9	-	-
Phillip Island	4	-	-	66.92	-	-	16	23	0.2	2.5	1.7	-	-	2.9	-	-
Pyramid Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Rodondo Island	1	-	-	62.29	-	-	11	11	0.2	0.2	1	-	-	1	-	-
Seal Islands	-	-	-	-	-	-	-	-	< 0.1	0.2	-	-	-	-	-	-

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Shellback Island	1	-	-	91.88	-	-	10	10	0.2	0.2	1	-	-	1	-	-
Skull Rock	4	-	-	43.29	-	-	20	29	< 0.1	1.2	1.4	-	-	1.9	-	-
South Gippsland	13	-	-	28.79	-	-	17	71	1.1	16.5	9.7	-	-	26.8	-	-
Surf Coast	8	-	-	22.42	-	-	23	78	0.4	7.1	13.7	-	-	25.8	-	-
Warrnambool	63	6	-	7.63	16.25	-	24	169	0.8	13.3	8.5	1.4	-	19.1	3.8	-
Wattle Range	3	-	-	21.42	-	-	14	15	< 0.1	0.1	1.9	-	-	2.9	-	-

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Table 15.5 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 3 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	31	-	-	22.67	-	-	25	61	0.1	0.8	1	-	-	1.9	-	-
Bass Coast	22	-	-	23.08	-	-	14	25	0.2	1.4	1.7	-	-	3.8	-	-
Colac Otway	98	52	-	6.17	9.75	-	35	297	8	19.8	18.9	2.8	-	44.9	9.6	-
Corangamite	99	58	-	5.00	9.13	-	47	600	13.2	54.3	22	6.1	-	47.8	16.3	-
Curtis Island	2	-	-	74.67	-	-	12	13	< 0.1	0.2	1	-	-	1	-	-
East Gippsland	9	-	-	31.96	-	-	16	26	< 0.1	0.7	1.3	-	-	1.9	-	-
French Island	3	-	-	88.71	-	-	17	19	< 0.1	0.5	1.3	-	-	1.9	-	-
Glenelg	41	14	-	7.96	16.46	-	35	739	3	48.5	11.8	3.1	-	52.6	7.6	-
Glennie Group	38	-	-	20.88	-	-	17	69	0.3	2.0	2.9	-	-	7.6	-	-
Grant	1	-	-	65.92	-	-	12	12	0.8	0.8	1	-	-	1	-	-
Greater Geelong	3	-	-	62.75	-	-	17	22	< 0.1	1.0	1.6	-	-	1.9	-	-
Hogan Island Group	9	-	-	26.96	-	-	15	21	< 0.1	0.4	1.3	-	-	1.9	-	-
Kanowna Island	32	-	-	20.33	-	-	19	63	0.2	1.2	1.4	-	-	2.9	-	-
Kent Island Group	4	-	-	19.25	-	-	13	17	< 0.1	0.6	1.9	-	-	2.9	-	-
King Island	61	4	-	13.58	18.63	-	17	170	1.2	6.9	6.1	1	-	19.1	1	-
Lady Julia Percy Island	23	-	-	7.96	-	-	24	43	< 0.1	0.5	1	-	-	1	-	-
Laurence Rocks	28	2	-	8.54	66.67	-	21	120	0.2	2.8	1.8	1	-	2.9	1	-
Moncoeur Islands	16	-	-	20.13	-	-	13	24	< 0.1	0.6	1.4	-	-	2.9	-	-
Mornington Peninsula	21	-	-	28.04	-	-	17	80	0.3	2.2	2.5	-	-	4.8	-	-
Moyne	80	45	-	4.04	8.88	-	46	879	10.1	79.7	19.2	5.4	-	51.6	18.2	-
Norman Island	49	-	-	19.96	-	-	22	78	0.3	1.4	2.1	-	-	3.8	-	-
Phillip Island	18	-	-	28.75	-	-	18	77	0.2	2.7	1.9	-	-	5.7	-	-
Pyramid Island	1	-	-	28.13	-	-	12	12	< 0.1	0.1	1	-	-	1	-	-

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Rodondo Island	7	-	-	35.92	-	-	17	32	< 0.1	0.4	1	-	-	1	-	-
Seal Islands	4	-	-	28.08	-	-	17	35	< 0.1	0.7	1.2	-	-	1.9	-	-
Shellback Island	20	-	-	20.04	-	-	30	82	< 0.1	1	1	-	-	1	-	-
Skull Rock	30	-	-	20.33	-	-	20	63	0.1	1.1	1.4	-	-	1.9	-	-
South Gippsland	73	9	-	19.25	57.92	-	24	204	2.6	18.2	10.3	1.4	-	43	3.8	-
Surf Coast	14	-	-	11.29	-	-	18	84	0.5	9.2	7.8	-	-	22.9	-	-
Warrnambool	58	15	-	7.42	20.13	-	30	240	2	11.2	7.2	2.2	-	19.1	3.8	-
Wattle Range	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-

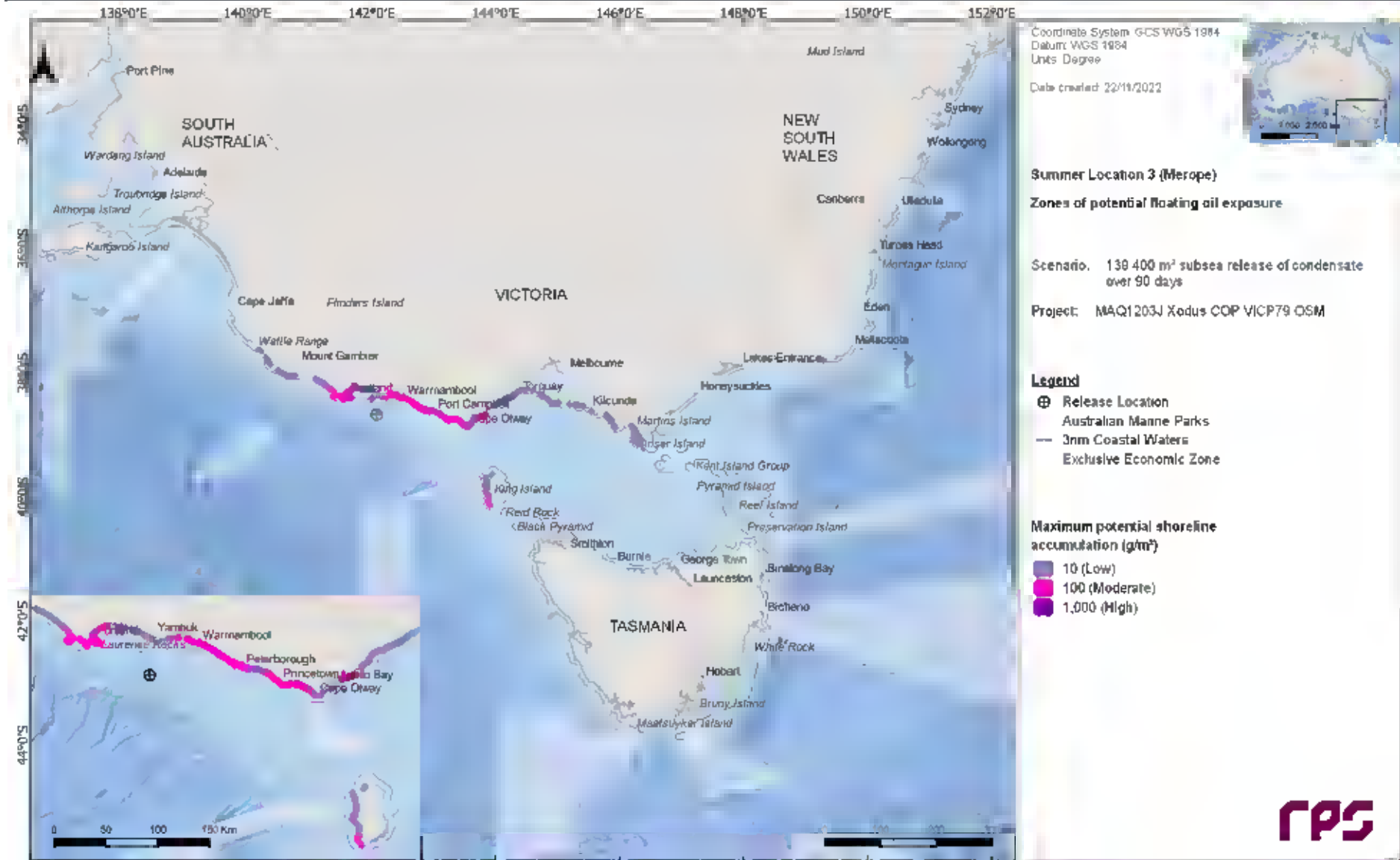


Figure 15.4 Maximum potential shoreline loading from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

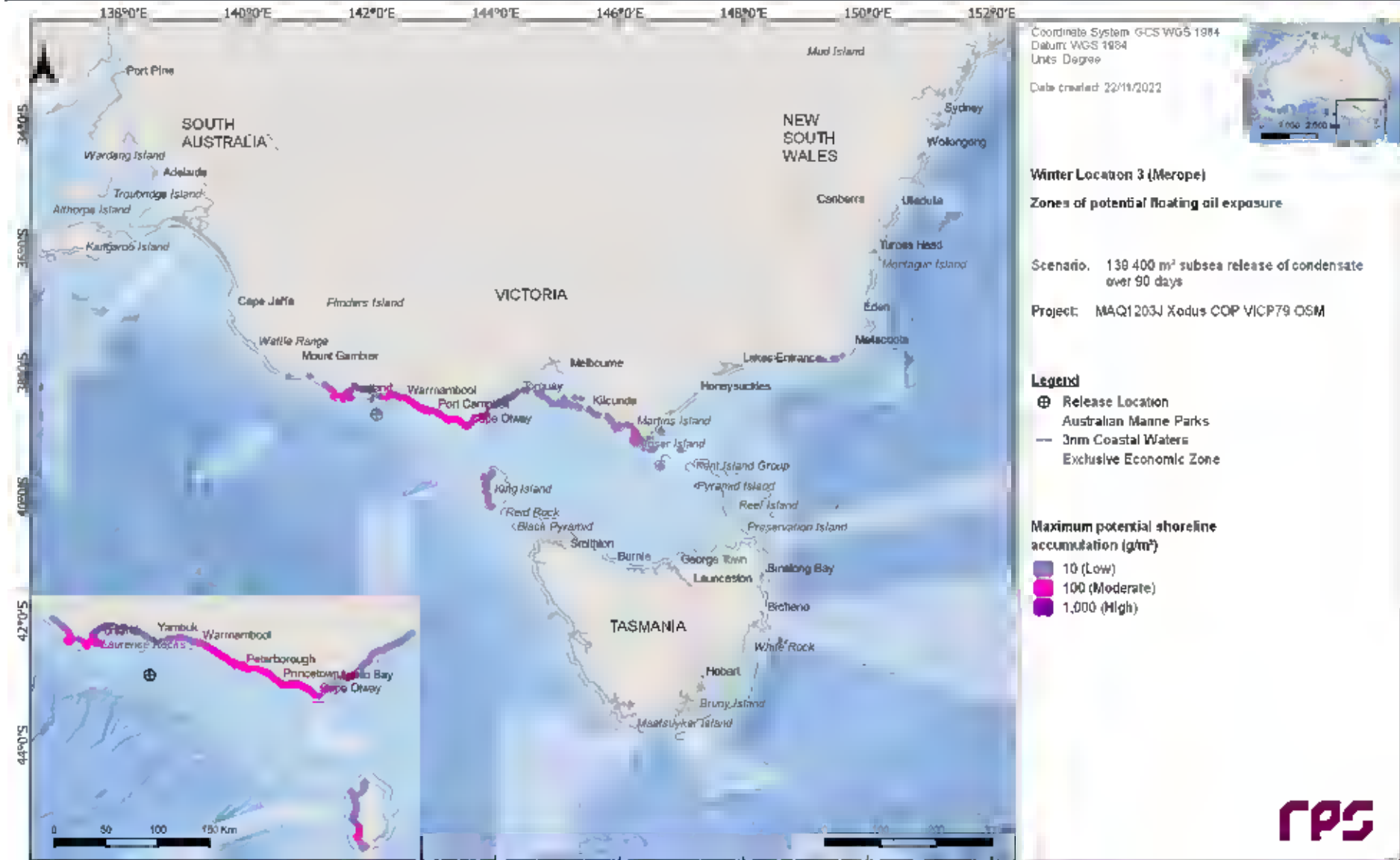


Figure 15.5 Maximum potential shoreline loading from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.2.3 In-water exposure

15.2.3.1 Dissolved Hydrocarbons

Table 15.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 15.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 15.6 and Figure 15.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 15.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	804	427	319
	Maximum distance (km) from release location (99 th percentile)	431	358	204
	Direction	ENE	E	E
Winter	Maximum distance (km) from release location	731	451	295
	Maximum distance (km) from release location (99 th percentile)	516	339	188
	Direction	ENE	E	WNW

Table 15.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Mod erate	High		Low	Mode rate	High	
AMP	Apollo	1,759	86	70	10	3,182	99	97	32
	Beagle	173	8	3	-	155	29	7	-
	Boags	6	-	-	-	16	1	-	-
	Franklin	215	7	2	-	68	6	1	-
	Murray	19	1	-	-	15	1	-	-
	Nelson	348	7	3	-	315	4	1	-
	Zeehan	1,160	66	26	1	1,082	51	24	3
IBRA	Bateman	2	-	-	-	13	1	-	-
	Bridgewater	1,559	59	37	4	862	29	16	4
	East Gippsland Lowlands	13	1	-	-	15	1	-	-
	Flinders	24	2	-	-	46	7	-	-
	Gippsland Plain	115	6	2	-	326	31	5	-
	Glenelg Plain	1,157	69	54	5	950	37	22	4
	King Island	210	16	4	-	161	31	5	-
	Otway Plain	1,043	85	67	10	1,709	100	98	22
	Otway Ranges	1,191	88	69	11	1,693	100	98	16
	Strzelecki Ranges	104	5	2	-	131	28	4	-
	Warrnambool Plain	2,215	94	78	18	2,607	100	98	19
	Wilson's Promontory	242	7	3	-	234	37	9	-
	IMCRA	Batemens Shelf	8	-	-	-	18	1	-
Boags		9	-	-	-	23	2	-	-
Central Bass Strait		2,546	76	50	6	3,188	98	94	26
Central Victoria		1,404	81	60	9	2,326	99	96	28
Coorong		116	9	2	-	136	3	2	-
Flinders		267	8	4	-	320	39	12	-
Franklin		158	7	2	-	107	5	1	-
Otway		6,757	100	100	100	6,771	100	100	100
Twofold Shelf		58	4	1	-	166	15	2	-
Victorian Embayments		72	3	1	-	86	10	1	-
KEF	Victorian Embayments	7	-	-	-	115	5	2	-
	Bonney Coast Upwelling	5,512	98	90	69	3,254	93	88	60

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	Upwelling East of Eden	16	1	-	-	49	4	-	-
	West Tasmania Canyons	2,389	92	74	9	2,359	74	56	12
MNP	Bunurong	126	5	2	-	128	21	4	-
	Cape Howe	8	-	-	-	14	1	-	-
	Churchill Island	13	1	-	-	21	3	-	-
	Corner Inlet	1	-	-	-	36	3	-	-
	Discovery Bay	1,607	57	34	4	477	26	16	1
	Ninety Mile Beach	5	-	-	-	14	1	-	-
	Point Addis	132	8	3	-	469	20	6	1
	Point Hicks	10	1	-	-	21	3	-	-
	Port Phillip Heads	24	3	-	-	54	5	1	-
	Twelve Apostles	1,853	93	79	19	1,813	100	100	25
	Wilsons Promontory	216	7	2	-	241	33	9	-
MP	Batemans	2	-	-	-	13	1	-	-
	Lower South East	79	17	2	-	85	3	1	-
MS	Marengo Reefs	411	47	21	1	291	96	56	-
	Merri	201	59	20	-	174	39	15	-
	Mushroom Reef	37	2	-	-	78	7	1	-
	The Arches	807	86	56	4	925	99	74	3
NP	Kent Group	17	1	-	-	5	-	-	-
NPS4	Bunurong Marine Park	77	2	1	-	239	15	3	-
	Corner Inlet Marine and Coastal Park	8	-	-	-	111	4	2	-
	Nooramunga Marine and Coastal Park	4	-	-	-	115	5	1	-
	Shallow Inlet Marine and Coastal Park	4	-	-	-	75	4	1	-
	Wilsons Promontory Marine Park	146	5	2	-	116	12	2	-
	Wilsons Promontory Marine Reserve	45	4	-	-	111	30	6	-
	Corner Inlet	8	-	-	-	115	5	2	-
Ramsar	Glenelg Estuary and Discovery Bay Wetlands	157	22	2	-	26	4	-	-
	Lavinia	28	3	-	-	24	2	-	-
	Piccaninnie Ponds Karst Wetlands	22	1	-	-	4	-	-	-
	Port Phillip Bay (Western)	24	2	-	-	34	2	-	-

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	Shoreline) and Bellarine Peninsula							
	Western Port	35	2	-	-	25	3	-
	Bell Reef	47	7	-	-	70	8	1
	Bravenes Rock	1,171	89	75	7	1,497	100	98
	Brown Rocks	2	-	-	-	15	1	-
RSB	Cody Bank	178	8	4	-	202	37	12
	Cutter Rock	17	3	-	-	34	11	-
	New Zealand Star Bank	7	-	-	-	26	2	-
	Albatross Island	8	-	-	-	17	1	-
	Anser Island	88	6	2	-	172	30	8
	Bass Coast	111	3	1	-	326	18	3
	Bega Valley	6	-	-	-	15	1	-
	Black Pyramid	102	4	2	-	30	4	-
	Circular Head	12	1	-	-	31	1	-
	Colac Otway	1,073	85	67	10	1,709	100	98
	Corangamite	2,215	93	78	18	1,966	100	98
	Curtis Island	14	1	-	-	23	4	-
	East Gippsland	13	1	-	-	13	1	-
	French Island	27	2	-	-	14	1	-
	Glenelg	1,695	69	52	5	950	37	22
	Glennie Group	50	7	-	-	190	37	7
	Grant	138	6	1	-	60	3	1
	Greater Geelong	52	3	1	-	62	6	1
	Hogan Island Group	24	2	0	-	46	7	-
Nearshore Waters	Hunter Island	2	-	-	-	38	1	-
	Kanowna Island	88	6	2	-	234	33	8
	Kent Island Group	17	1	-	-	5	-	-
	King Island	207	16	4	-	161	31	5
	Lady Julia Percy Island	1,337	76	61	8	996	61	33
	Laurence Rocks	999	69	56	7	621	28	15
	Martins Island	1	-	-	-	31	4	-
	Moncoeur Islands	153	6	3	-	123	30	3
	Montague Island	-	-	-	-	13	1	-
	Mornington Peninsula	75	4	1	-	273	17	3
	Moyne	1,662	94	78	18	2,607	100	84
	Mud Island	12	1	-	-	23	2	-
	Norman Island	98	4	2	-	224	22	2
	Phillip Island	88	6	1	-	150	17	2
	Reid Rock	43	10	-	-	24	7	-
	Rodondo Island	242	6	3	-	199	30	7

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	Seal Islands	90	3	1	-	41	8	-	-
	Shellback Island	146	5	2	-	116	14	3	-
	Skull Rock	121	7	1	-	234	32	9	-
	South Gippsland	115	5	2	-	188	31	7	-
	Surf Coast	250	10	4	-	217	31	6	-
	Three Hummock Island	1	-	-	-	20	1	-	-
	Warrnambool	532	68	33	2	549	66	36	3
	Wattle Range	11	1	-	-	2	-	-	-
	Wellington	9	-	-	-	115	5	1	-
State Waters	New South Wales	8	-	-	-	15	1	-	-
	South Australia	220	18	2	-	137	3	3	-
	Tasmania	369	21	7	-	265	38	13	-
	Victoria	2,675	96	91	35	3,011	100	100	33

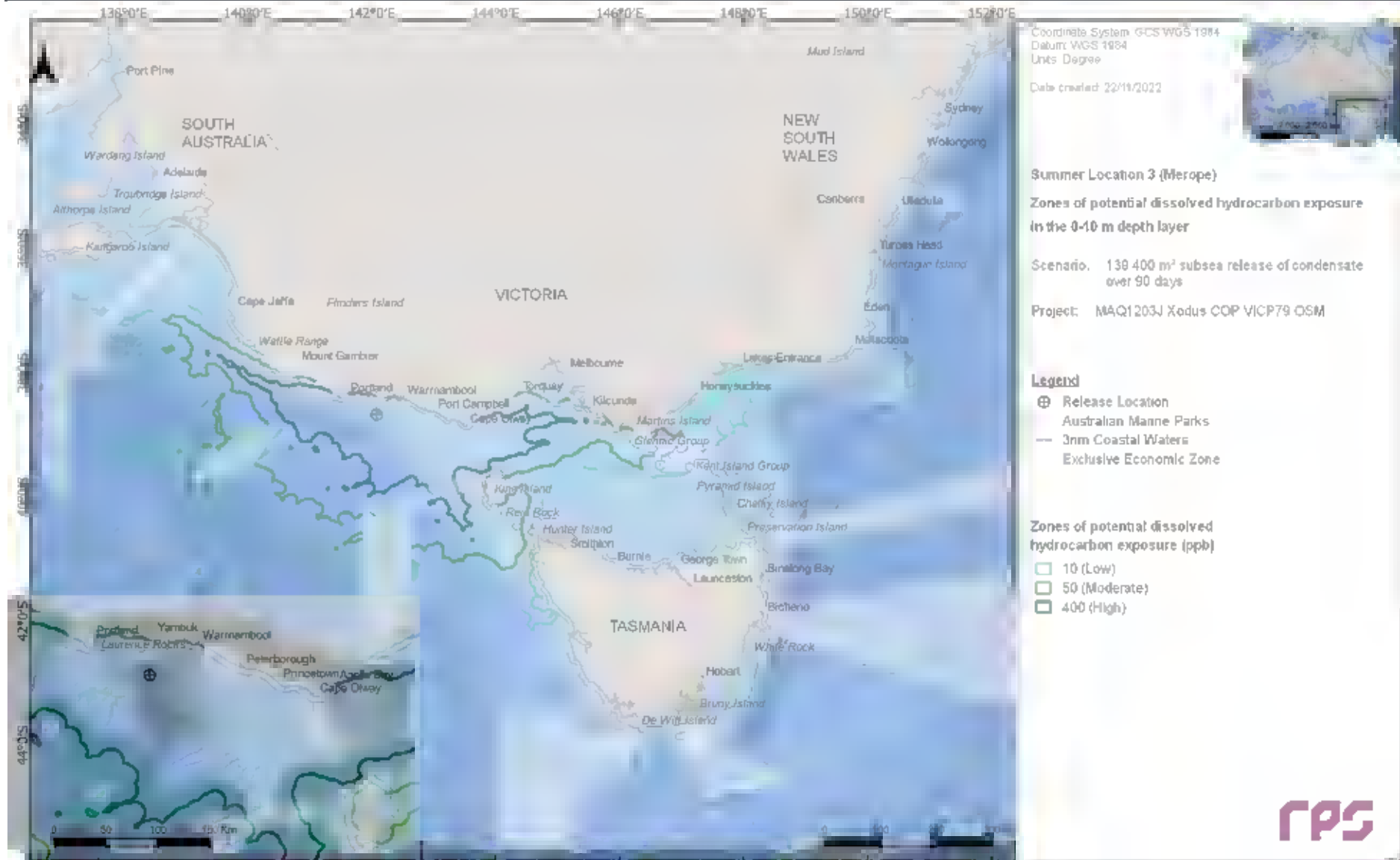


Figure 15.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

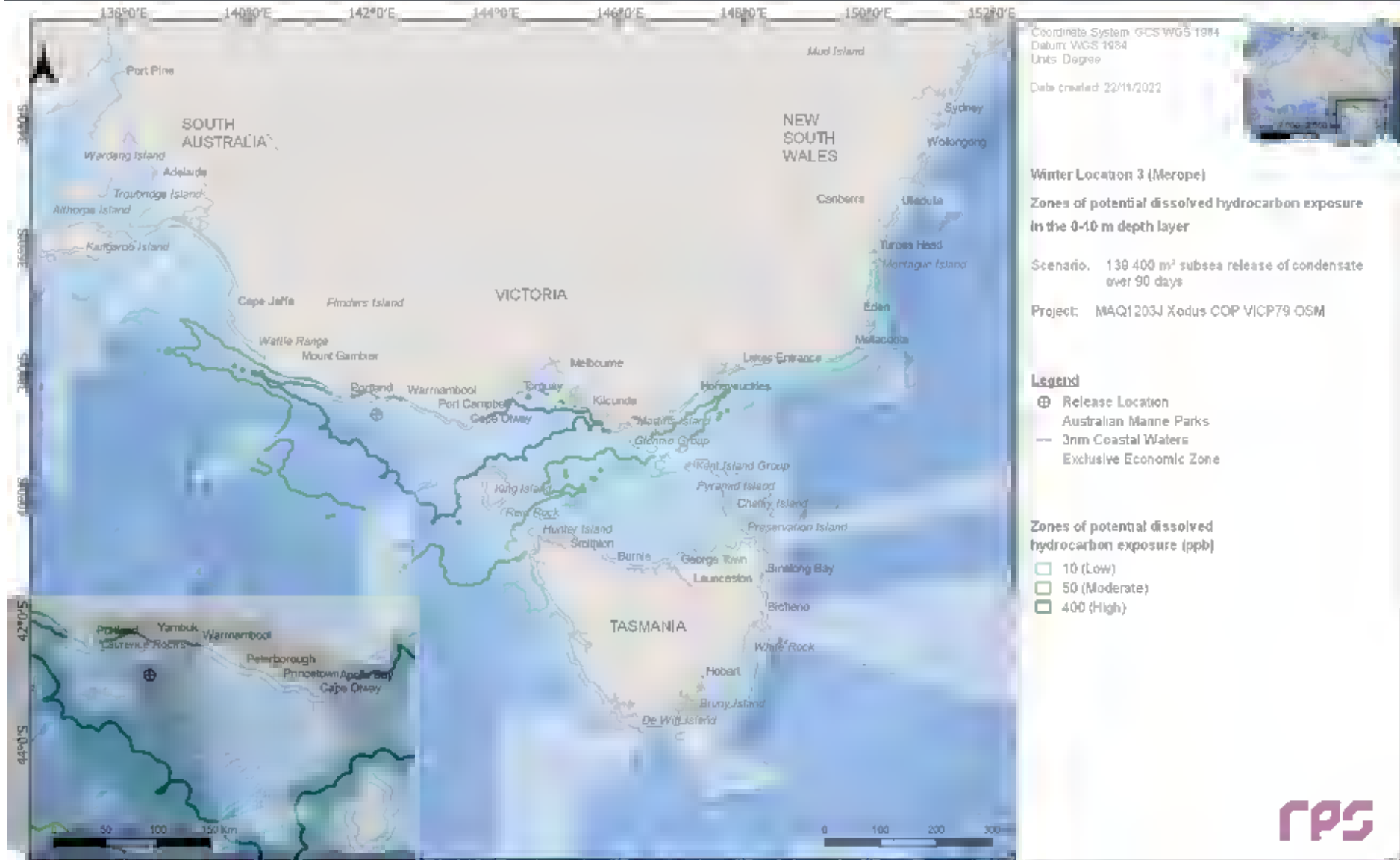


Figure 15.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.2.3.2 Entrained Hydrocarbons

Table 15.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

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Table 15.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 15.8 and Figure 15.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 15.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	897	409
	Maximum distance (km) from release location (99 th percentile)	819	348
	Direction	ENE	E
Winter	Maximum distance (km) from release location	831	450
	Maximum distance (km) from release location (99 th percentile)	792	370
	Direction	ENE	E

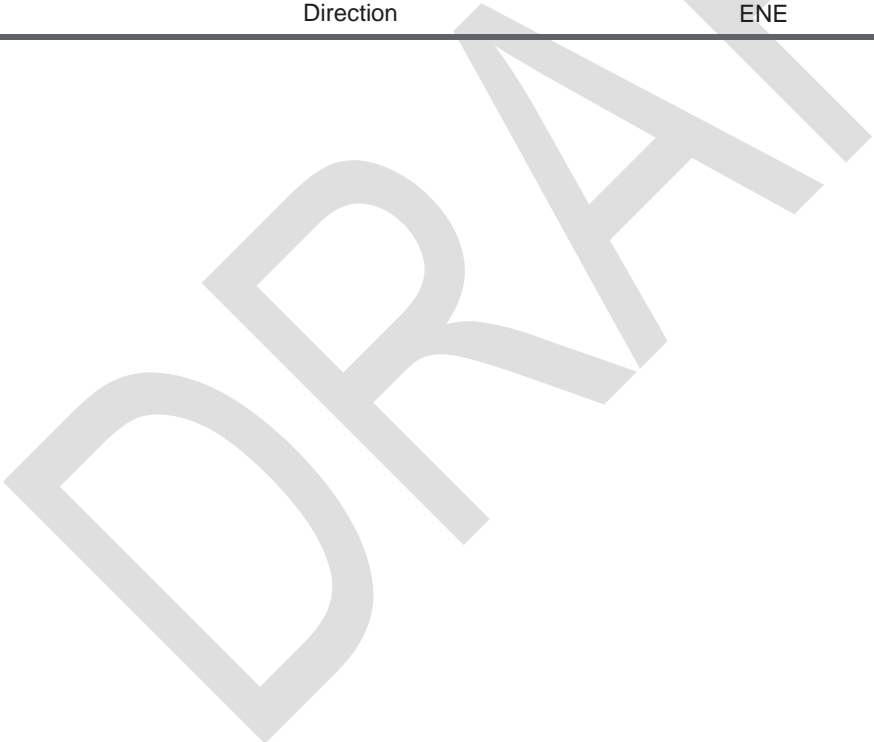


Table 15.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	878	95	79	952	100	98
	Beagle	117	32	5	192	81	14
	Boags	33	16	-	29	25	-
	East Gippsland	22	5	-	27	20	-
	Flinders	4	-	-	11	1	-
	Franklin	114	30	2	122	27	1
	Murray	63	20	-	42	3	-
	Nelson	98	28	-	123	6	3
	Zeehan	483	83	26	531	83	30
IBRA	Bateman	23	2	-	41	13	-
	Bridgewater	654	73	50	659	48	27
	East Gippsland Lowlands	28	12	-	38	55	-
	Flinders	65	24	-	131	70	8
	Gippsland Plain	144	45	5	262	92	17
	Glenelg Plain	1,010	83	70	978	54	32
	King Island	242	57	5	212	74	14
	Otway Plain	1,217	96	80	1,152	100	100
	Otway Ranges	883	96	83	832	100	100
	South East Coastal Ranges	14	2	-	17	13	-
	Strzelecki Ranges	81	37	-	147	92	7
	Tasmanian West	20	15	-	18	5	-
	Warrnambool Plain	1,834	100	96	2,129	100	100
	Wilson's Promontory	375	43	8	307	92	34
	IMCRA	Batemans Shelf	61	4	-	80	25
Boags		31	17	-	29	24	-
Central Bass Strait		826	92	57	931	100	96
Central Victoria		851	94	70	908	100	98
Coorong		111	25	2	72	3	-
Davey		19	3	-	5	-	-
Flinders		375	43	8	330	92	35
Franklin		84	34	-	83	20	-
Otway		12,776	100	100	13,550	100	100
Twofold Shelf		96	26	-	163	75	8
KEF	Victorian Embayments	80	37	-	238	72	4
	Big Horseshoe Canyon	25	8	-	17	19	-
	Bonney Coast Upwelling	2,024	100	97	1,960	97	92
	Canyons on the eastern continental slope	34	4	-	33	14	-

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	Shelf rocky reefs	32	4	-	47	14	-
	Upwelling East of Eden	65	17	-	84	67	-
	West Tasmania Canyons	789	96	54	898	91	62
	Bunurong	46	37	-	105	88	1
	Cape Howe	23	15	-	46	53	-
	Churchill Island	52	28	-	49	57	-
	Corner Inlet	5	0	-	18	3	-
	Discovery Bay	402	71	40	415	38	24
	French Island	8	-	-	22	7	-
MNP	Ninety Mile Beach	6	-	-	11	1	-
	Point Addis	116	52	3	167	76	5
	Point Hicks	28	13	-	40	58	-
	Port Phillip Heads	67	35	-	77	66	-
	Twelve Apostles	1,834	97	93	1,397	100	100
	Wilson's Promontory	375	42	8	299	92	35
	Yaringa	5	-	-	12	1	-
	Batemans	27	2	-	49	14	-
MP	Lower South East	207	62	10	97	7	-
	Upper South East	21	5	-	19	3	-
	Beware Reef	26	6	-	25	14	-
	Marengo Reefs	261	90	25	230	100	53
MS	Merri	657	96	60	356	66	31
	Mushroom Reef	50	36	-	201	70	3
	The Arches	731	97	84	1,307	100	81
NP	Kent Group	39	9	-	57	25	-
	Bunurong Marine Park	50	34	-	80	83	-
	Corner Inlet Marine and Coastal Park	41	24	-	74	60	-
	Nooramunga Marine and Coastal Park	7	-	-	18	3	-
NPS4	Shallow Inlet Marine and Coastal Park	44	24	-	49	57	-
	Wilson's Promontory Marine Park	174	38	5	289	92	23
	Wilson's Promontory Marine Reserve	353	42	8	303	92	32
	Corner Inlet	41	24	-	74	60	-
	Glenelg Estuary and Discovery Bay Wetlands	212	62	21	220	18	4
	Lavinia	32	6	-	26	25	-
Ramsar	Piccaninnie Ponds Karst Wetlands	83	44	-	40	5	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	73	26	-	84	47	-
	Western Port	46	28	-	143	55	3
	Bell Reef	47	39	-	61	39	-
RSB	Beware Reef	26	6	-	25	14	-
	Bravenes Rock	464	96	88	651	100	100

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	Brown Rocks	11	1	-	9	-	-
	Cody Bank	78	45	-	111	94	3
	Cutter Rock	51	27	-	82	72	-
	New Zealand Star Bank	34	16	-	47	65	-
	Wakitipu Rock	5	-	-	12	1	-
	Wright Rock	4	-	-	10	1	-
	Albatross Island	33	17	-	30	8	-
	Anser Island	249	41	7	269	91	33
	Bass Coast	55	35	-	94	85	-
	Bega Valley	15	8	-	36	31	-
	Black Pyramid	93	25	-	84	24	-
	Circular Head	16	14	-	16	5	-
	Colac Otway	1,217	96	83	1,152	100	100
	Corangamite	1,834	98	96	1,554	100	100
	Curtis Island	65	21	-	65	56	-
	East Gippsland	28	12	-	38	55	-
	Eurobodalla	17	2	-	23	12	-
	Frankston	7	-	-	15	3	-
	French Island	29	24	-	114	45	3
	Gabo Island	21	10	-	37	50	-
	Glenelg	1,010	83	70	978	54	32
	Glennie Group	375	43	8	303	92	34
	Grant	164	55	14	81	5	-
	Greater Geelong	90	31	-	101	67	1
	Hogan Island Group	59	24	-	131	70	8
	Hunter Island	19	6	-	11	1	-
Nearshore Waters	Huon Valley	10	1	-	5	-	-
	Kanowna Island	249	41	5	269	90	33
	Kent Island Group	36	11	-	93	30	-
	King Island	242	57	5	212	74	15
	Kingston	9	-	-	11	1	-
	Lady Julia Percy Island	1,314	91	74	1,290	71	58
	Laurence Rocks	722	81	65	806	65	27
	Maatsuyker Island	11	1	-	3	-	-
	Moncoeur Islands	120	30	5	209	80	17
	Montague Island	23	2	-	41	13	-
	Mornington Peninsula	120	45	3	227	74	5
	Moyne	1,448	100	96	2,129	98	88
	Mud Island	44	23	-	35	51	-
	Norman Island	231	38	5	302	92	31
	Phillip Island	62	40	-	204	79	4
	Pyramid Island	9	0	-	18	8	-
	Reid Rock	59	46	-	59	44	-
	Robe	21	5	-	19	3	-
	Rodondo Island	107	32	3	204	85	15
	Seal Islands	53	25	-	64	74	-
	Shellback Island	129	38	5	257	92	18

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	Skull Rock	252	41	6	245	90	33
	South Gippsland	252	39	5	307	92	30
	Surf Coast	167	62	2	169	78	4
	Three Hummock Island	19	3	0	11	1	-
	Warrnambool	760	99	67	1,016	71	58
	Wattle Range	90	22	-	16	3	-
	Wellington	10	2	-	20	4	-
	West Coast	20	15	-	18	5	-
	New South Wales	27	13	-	49	46	-
State Waters	South Australia	253	62	21	136	7	3
	Tasmania	325	58	8	274	75	28
	Victoria	1,834	100	96	2,146	100	100

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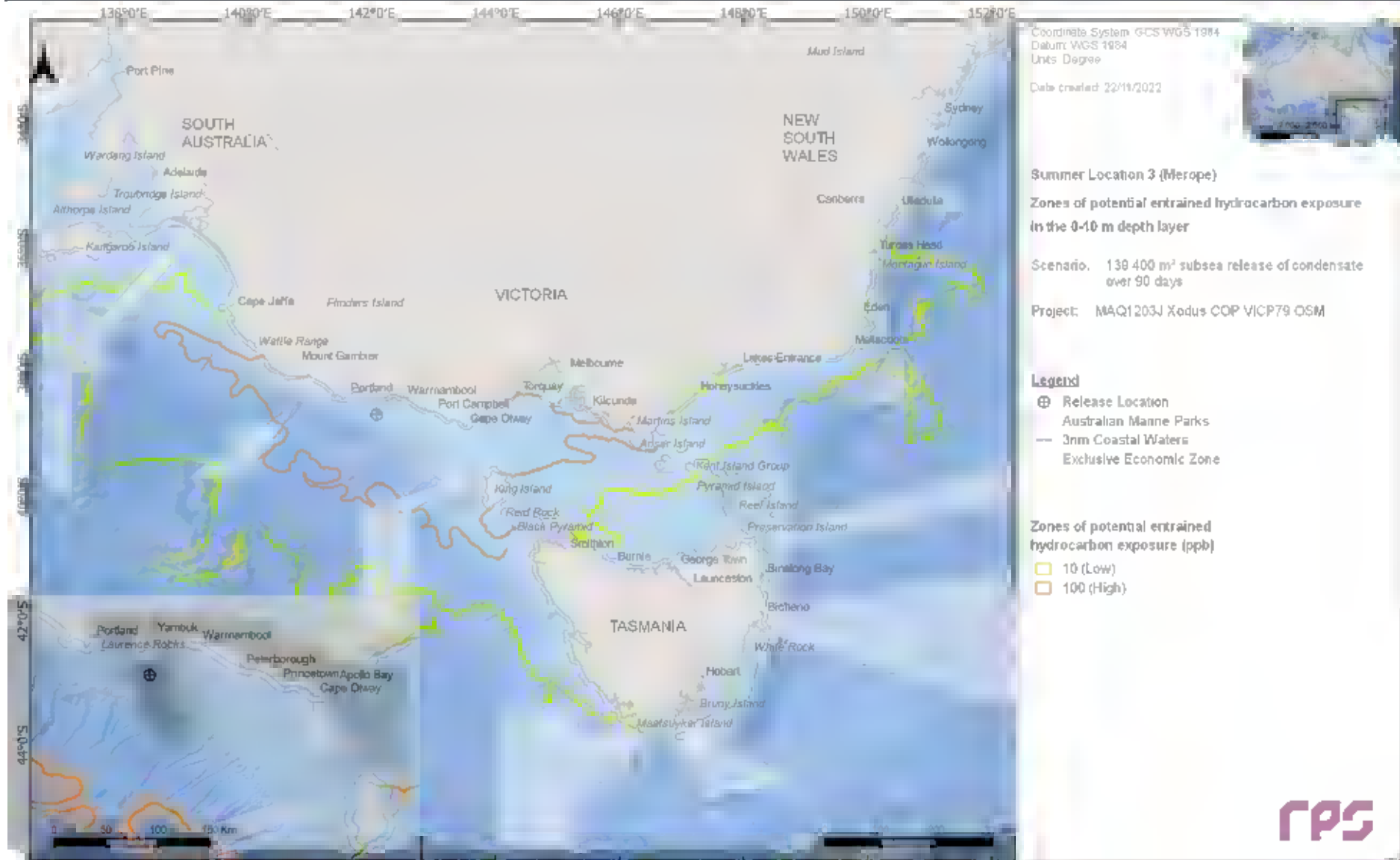


Figure 15.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

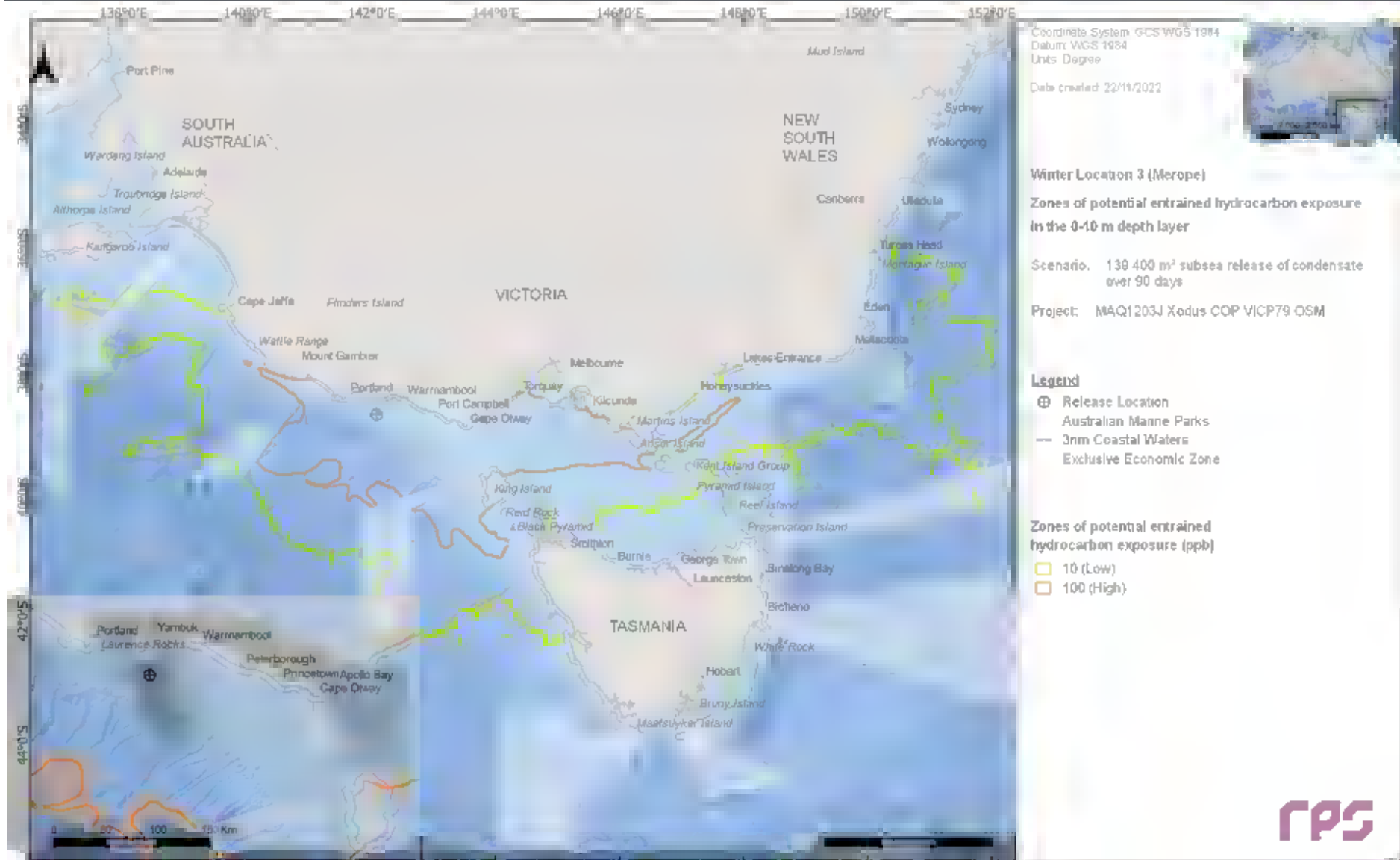


Figure 15.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

15.3 Deterministic Analysis

15.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 8 pm 2nd July 2010.

Figure 15.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 12.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 15.11 and Figure 15.12, respectively.

Figure 15.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 75,390 m³ (~54%) was lost to the atmosphere through evaporation. Approximately, 62,030 m³ (~45%) of the released volume decayed, while approximately 1,980 m³ (~1%) was predicted to remain within the water column and approximately 8 m³ (<0.01%) was present on the shorelines.

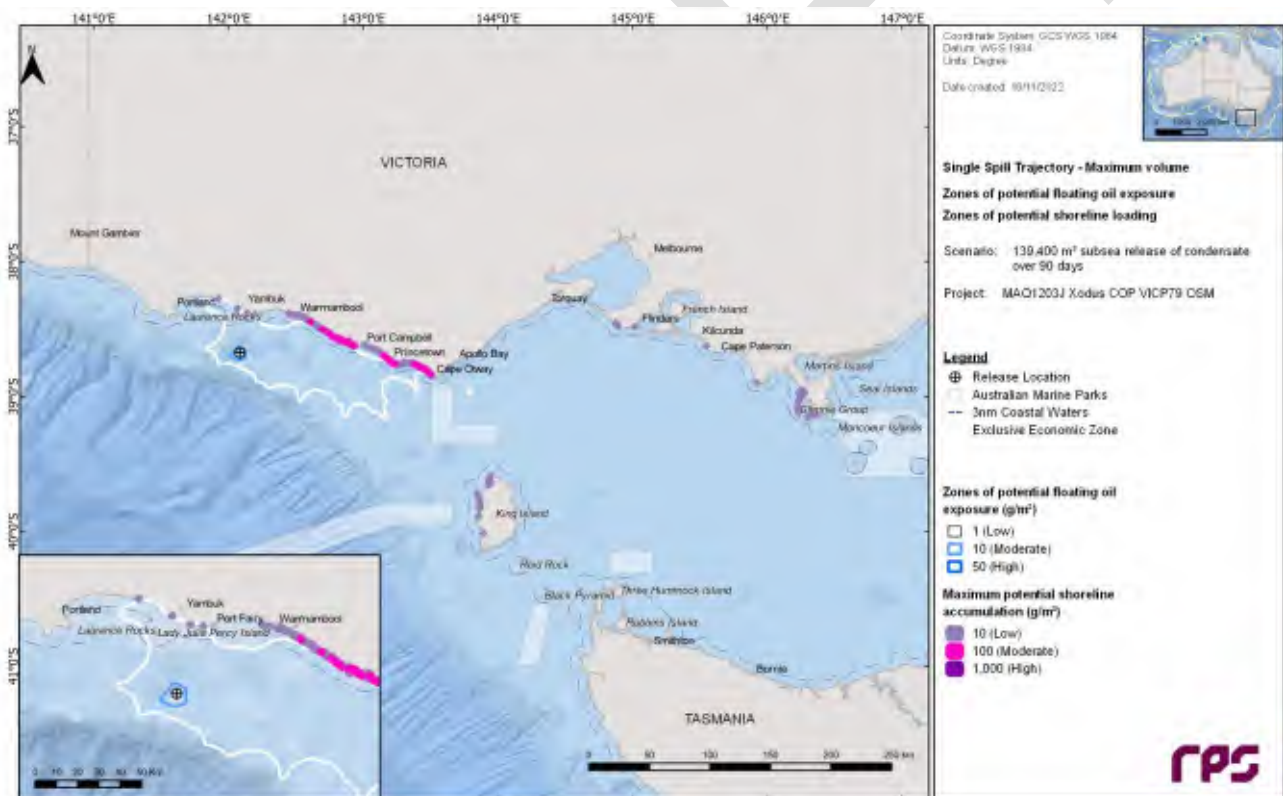


Figure 15.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

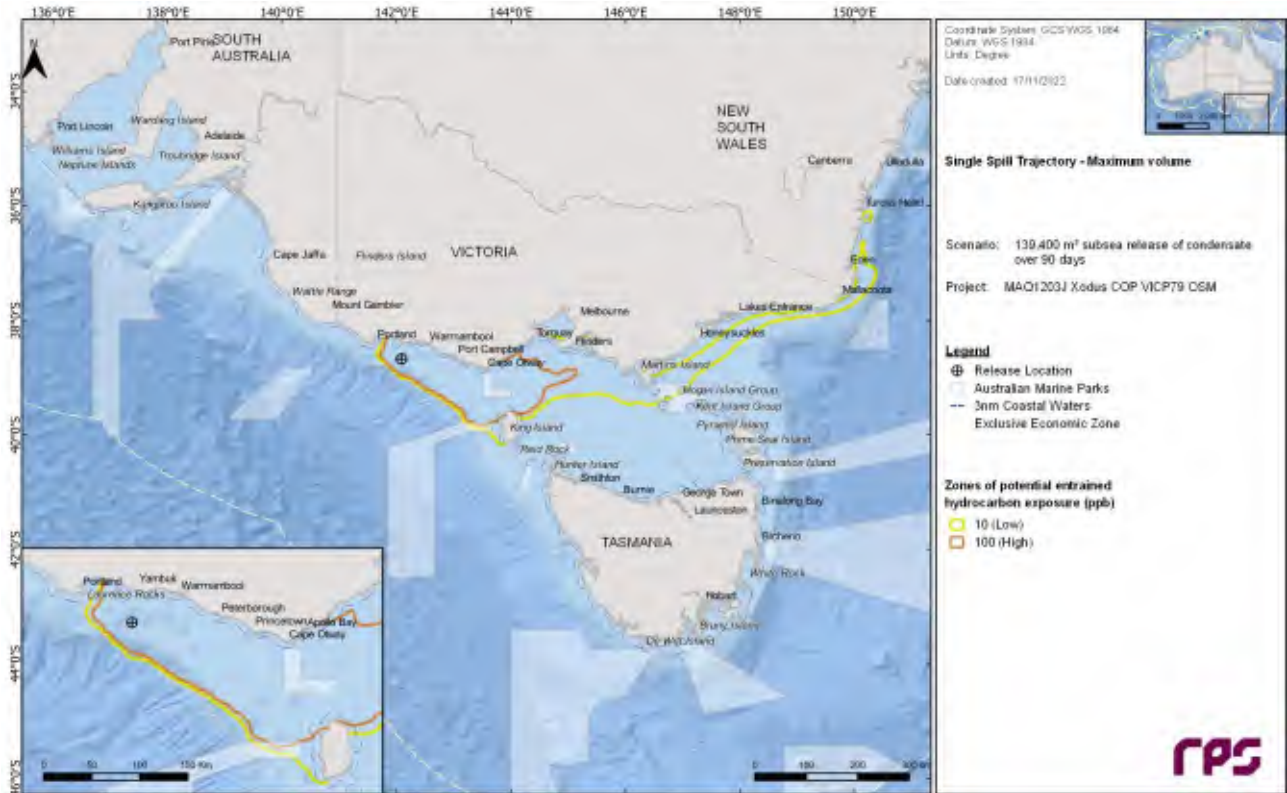


Figure 15.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

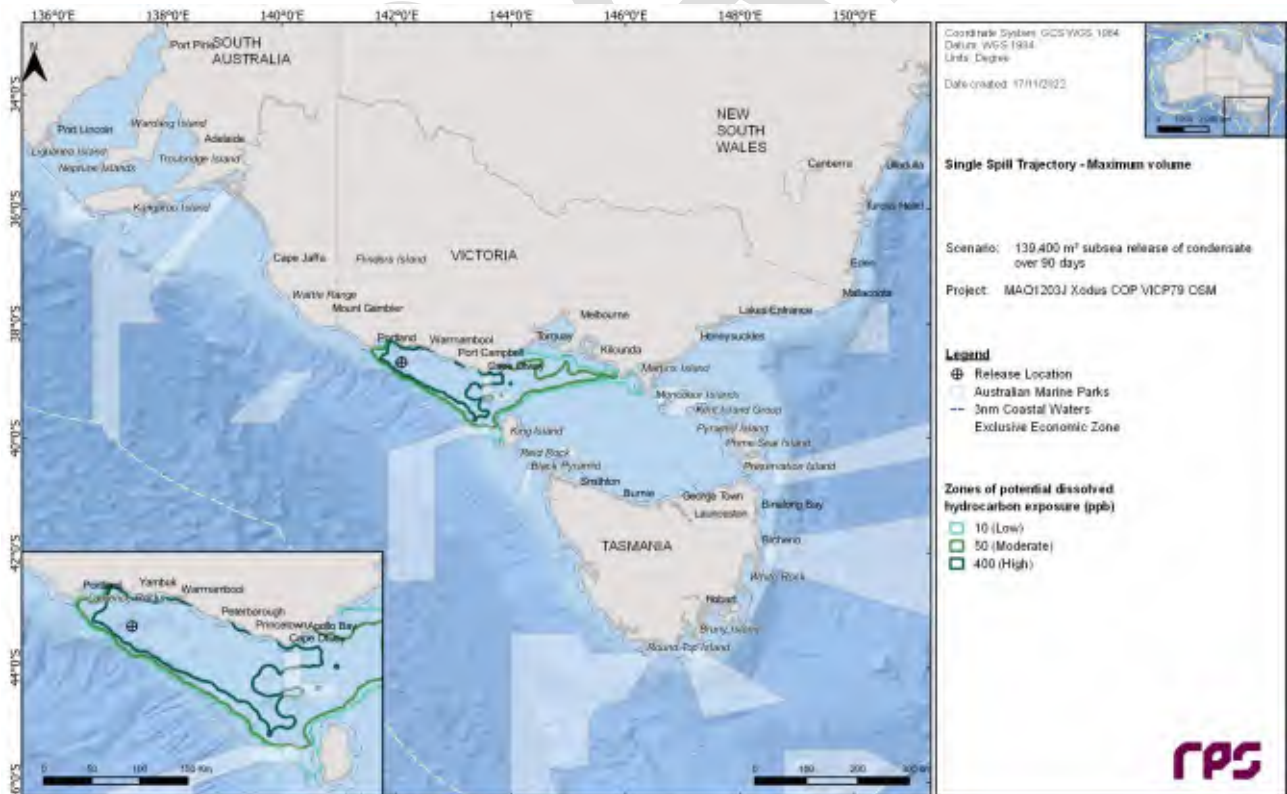


Figure 15.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

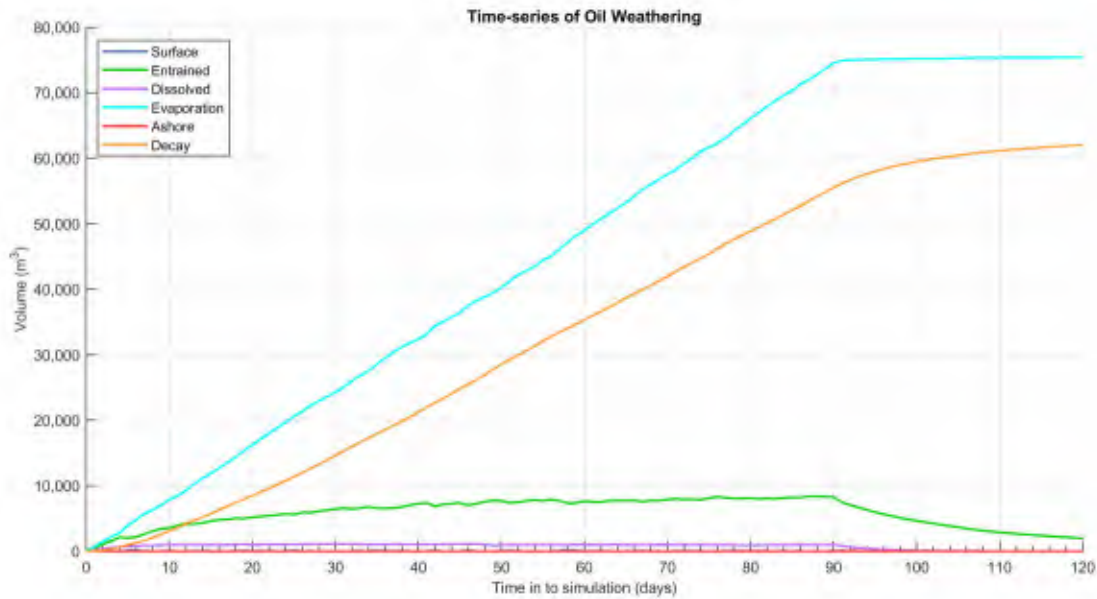


Figure 15.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 3.

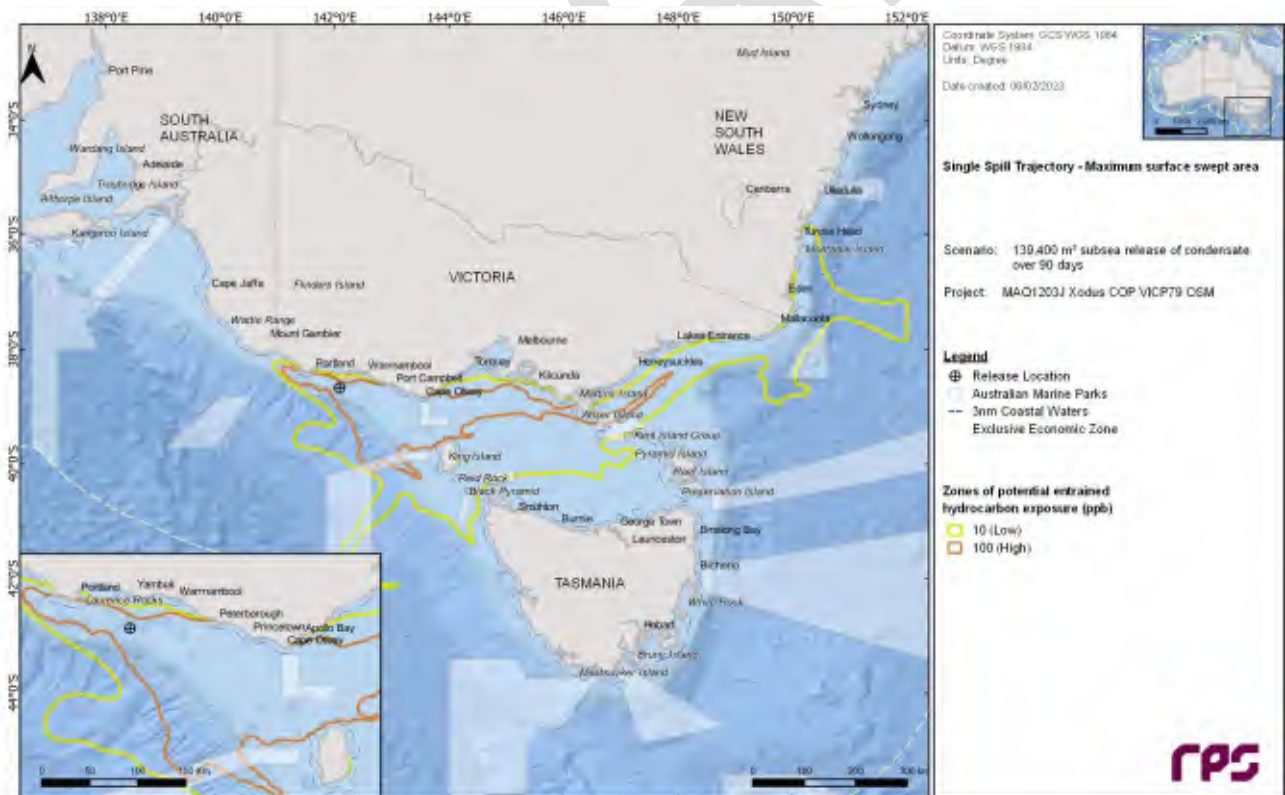
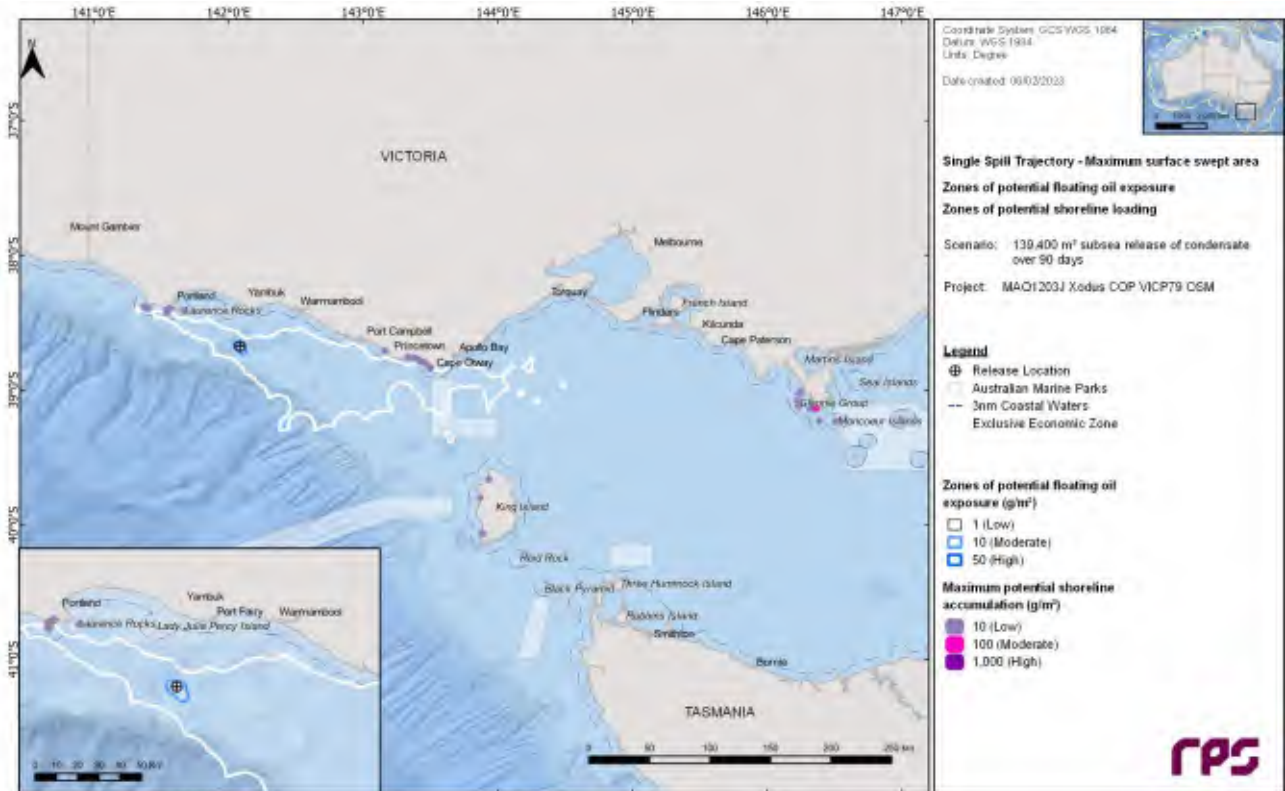
15.3.2 Largest Area of Floating Hydrocarbons Exposure

The simulation that resulted in the largest swept area of floating hydrocarbon exposure at or above the low threshold of 1,325 km² was identified as run number 34 and commenced during winter conditions, 2 pm 4th June 2013.

Figure 15.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days).

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 120 days is presented in Figure 15.15 and Figure 15.16, respectively.

Figure 15.17 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 73,940 m³ (~53%) was lost to the atmosphere through evaporation. Approximately, 59,700 m³ (~43%) of the released volume decayed, while approximately 1,520 m³ (~1%) was predicted to remain within the water column and approximately 1 m³ (<0.01%) was present on the shorelines.



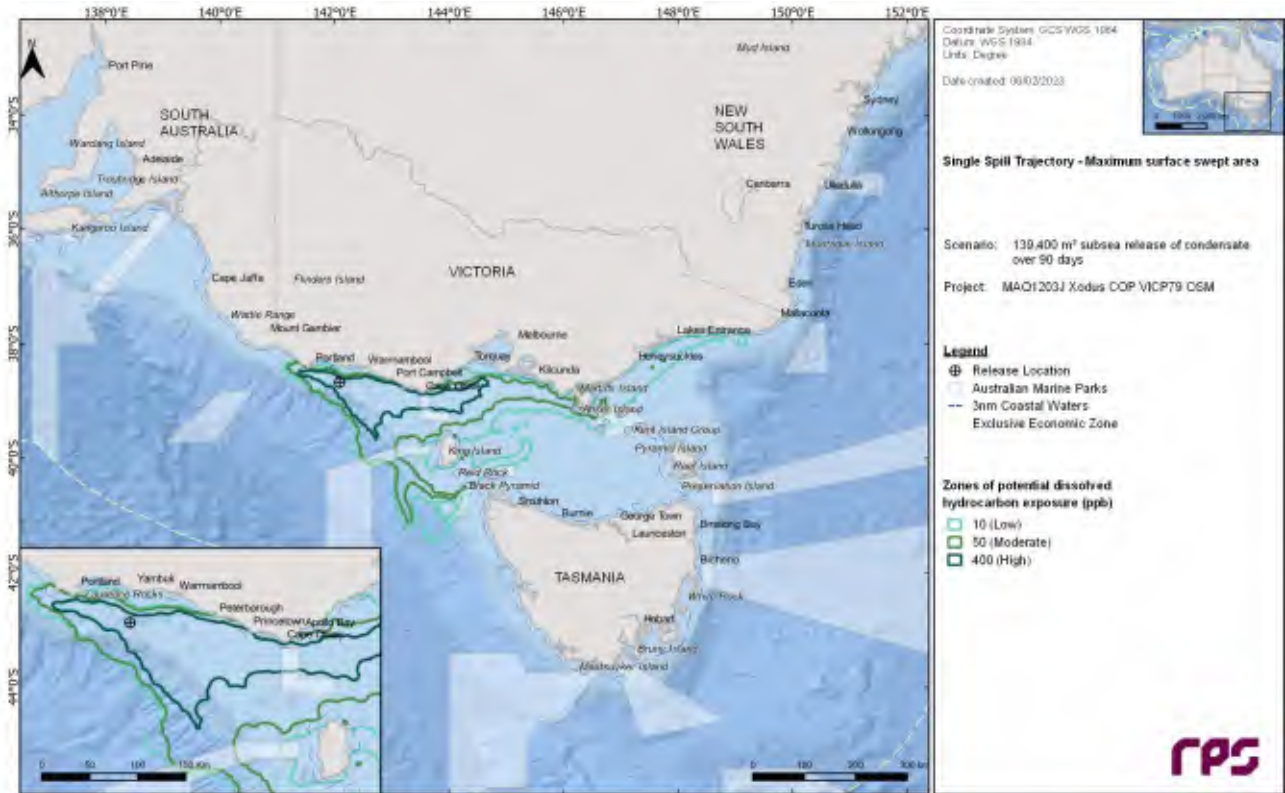


Figure 15.16 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days of the simulation that led to the largest area of floating hydrocarbon exposure from a subsea LOWC at Location 3.

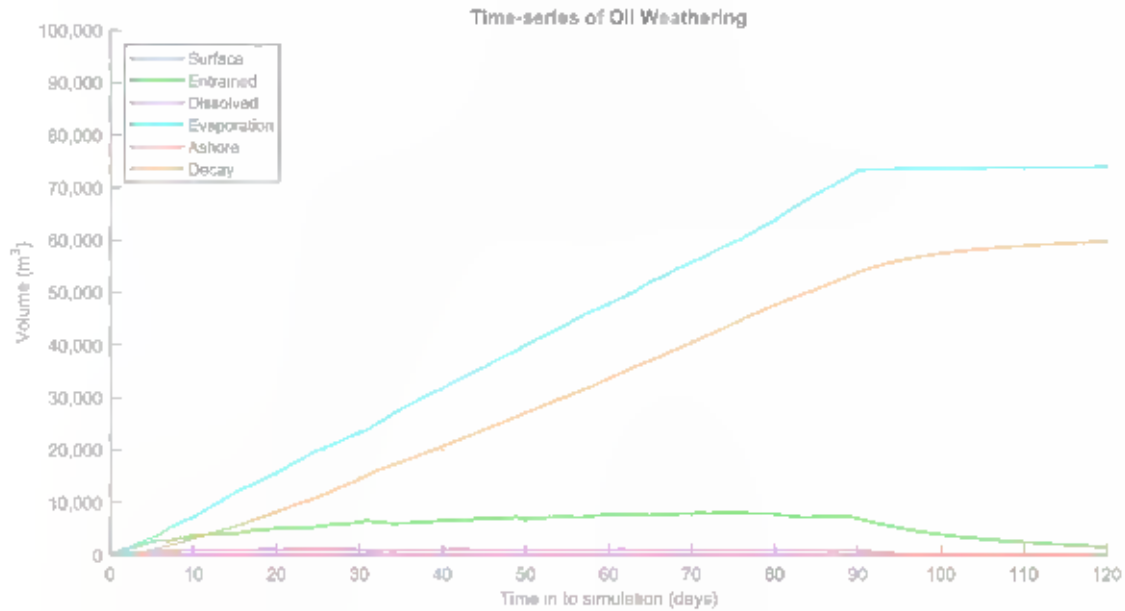


Figure 15.17 Predicted weathering and fates for the simulation that led to the area of floating oil exposure from a subsea LOWC at Location 3.

15.3.3 Longest Length of Shoreline Accumulation

The simulation that resulted in the longest length of hydrocarbons ashore of 231 km was identified as run number 11, which commenced during winter conditions, 6 pm 15th April 2011.

Figure 15.18 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 27 of the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 15.19 and Figure 15.20, respectively.

Figure 15.21 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 74,390 m³ (~53%) was lost to the atmosphere through evaporation. Approximately, 59,100 m³ (~42%) of the released volume decayed, while approximately 1,610 m³ (~1%) was predicted to remain within the water column and approximately 9 m³ (<0.1%) remained on shorelines.

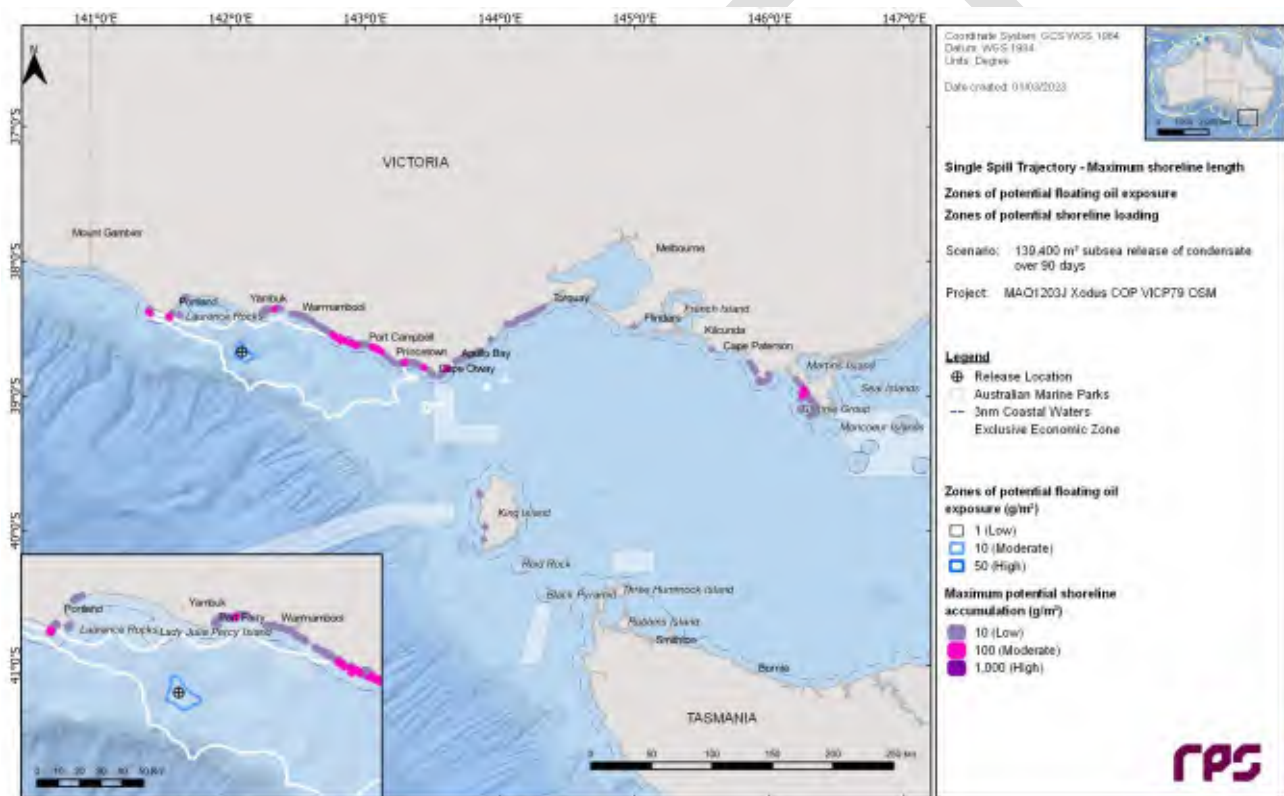


Figure 15.18 Predicted extent of the floating hydrocarbon exposure and shoreline loading over the entire 120 days for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

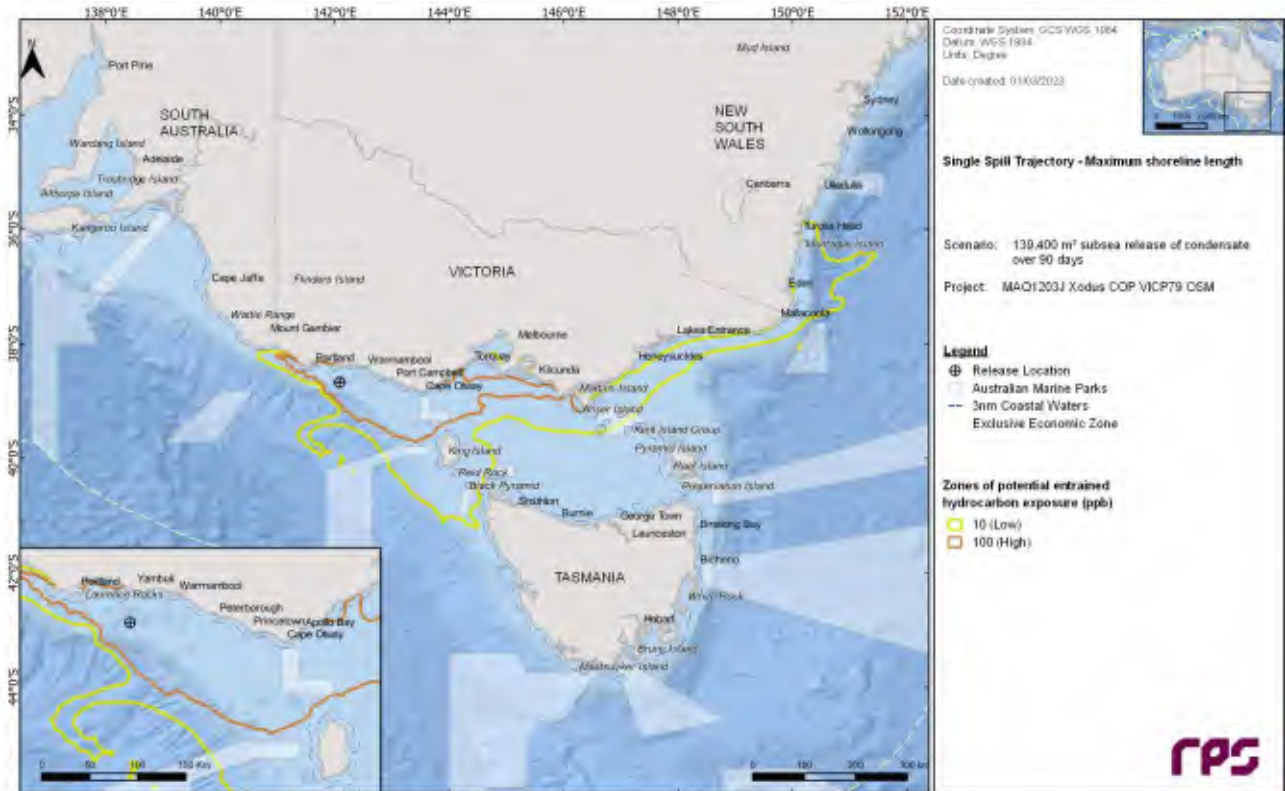


Figure 15.19 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

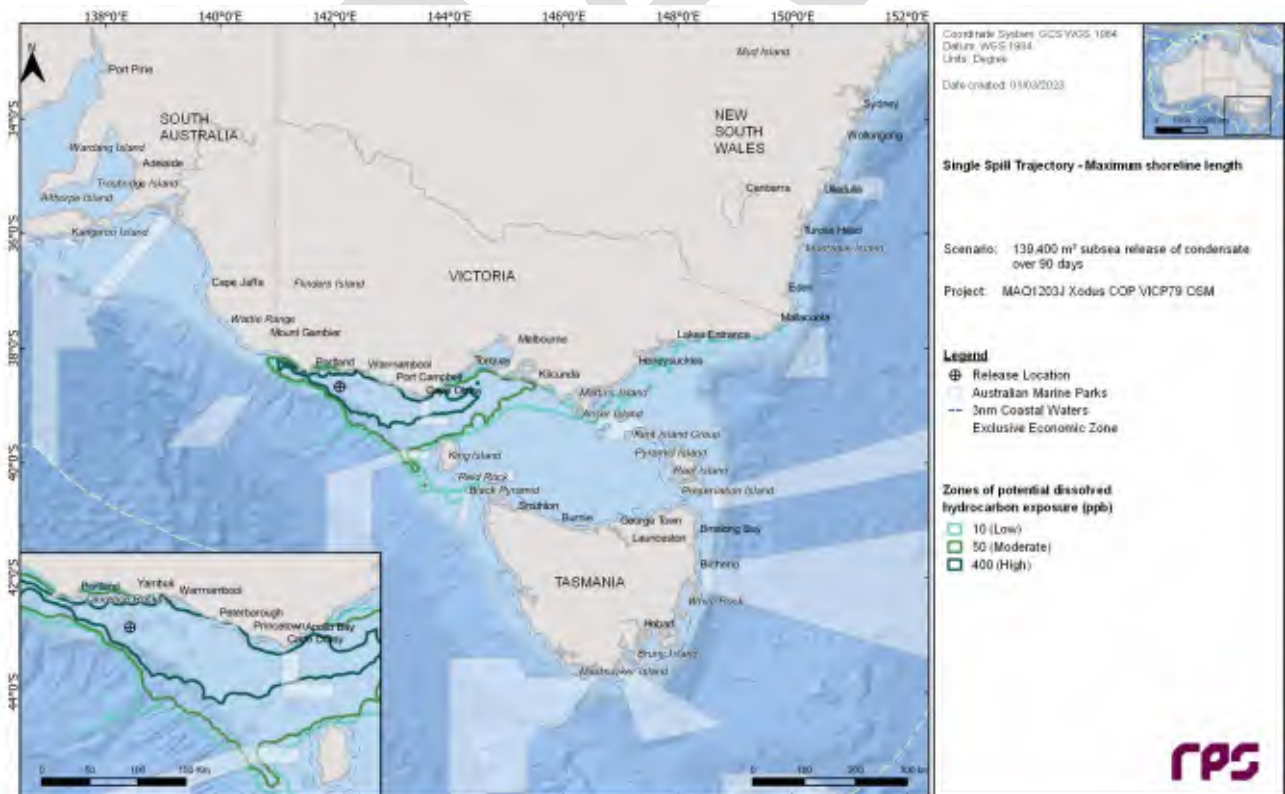


Figure 15.20 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

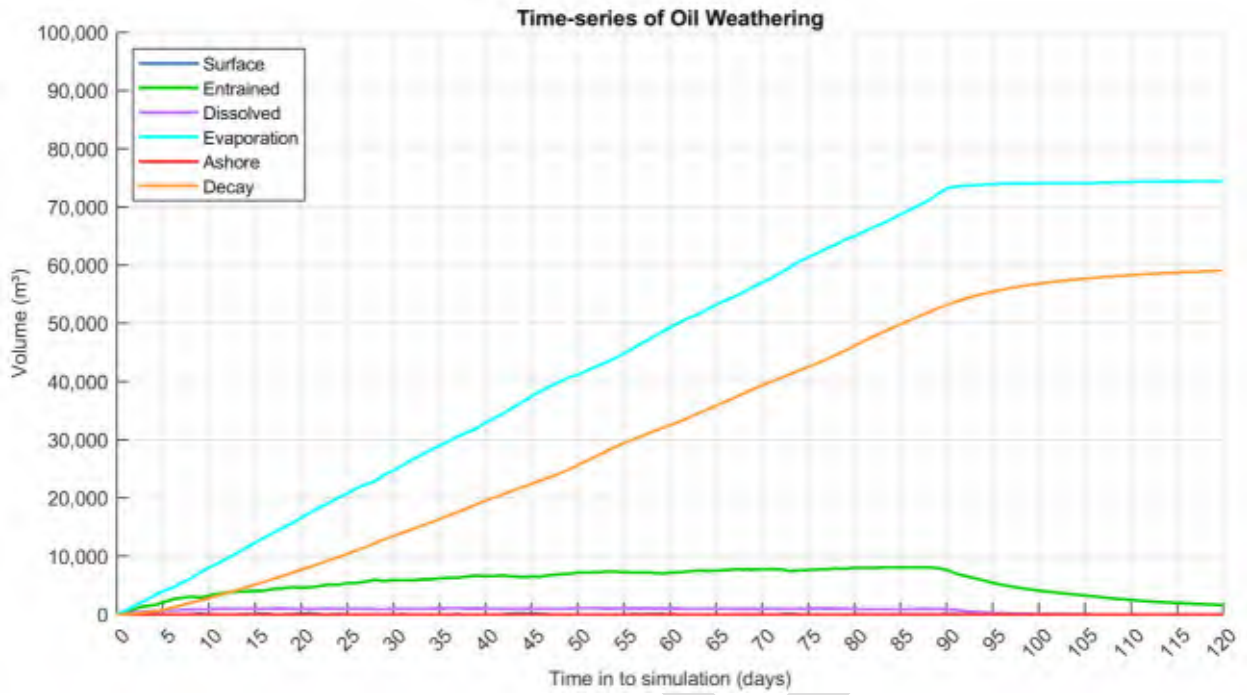


Figure 15.21 Predicted weathering and fates for the simulation that led to the longest length of shoreline accumulation from a subsea LOWC at Location 3.

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16 LOCATION 4 LOWC RESULTS

This scenario examined the potential exposure following a LOWC at Location 4. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 16.1 presents the EMBA, Section 16.2 shows the seasonal (or stochastic) results, while Section 16.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

16.1 EMBA

Figure 16.1 shows the EMBA for Location 4. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

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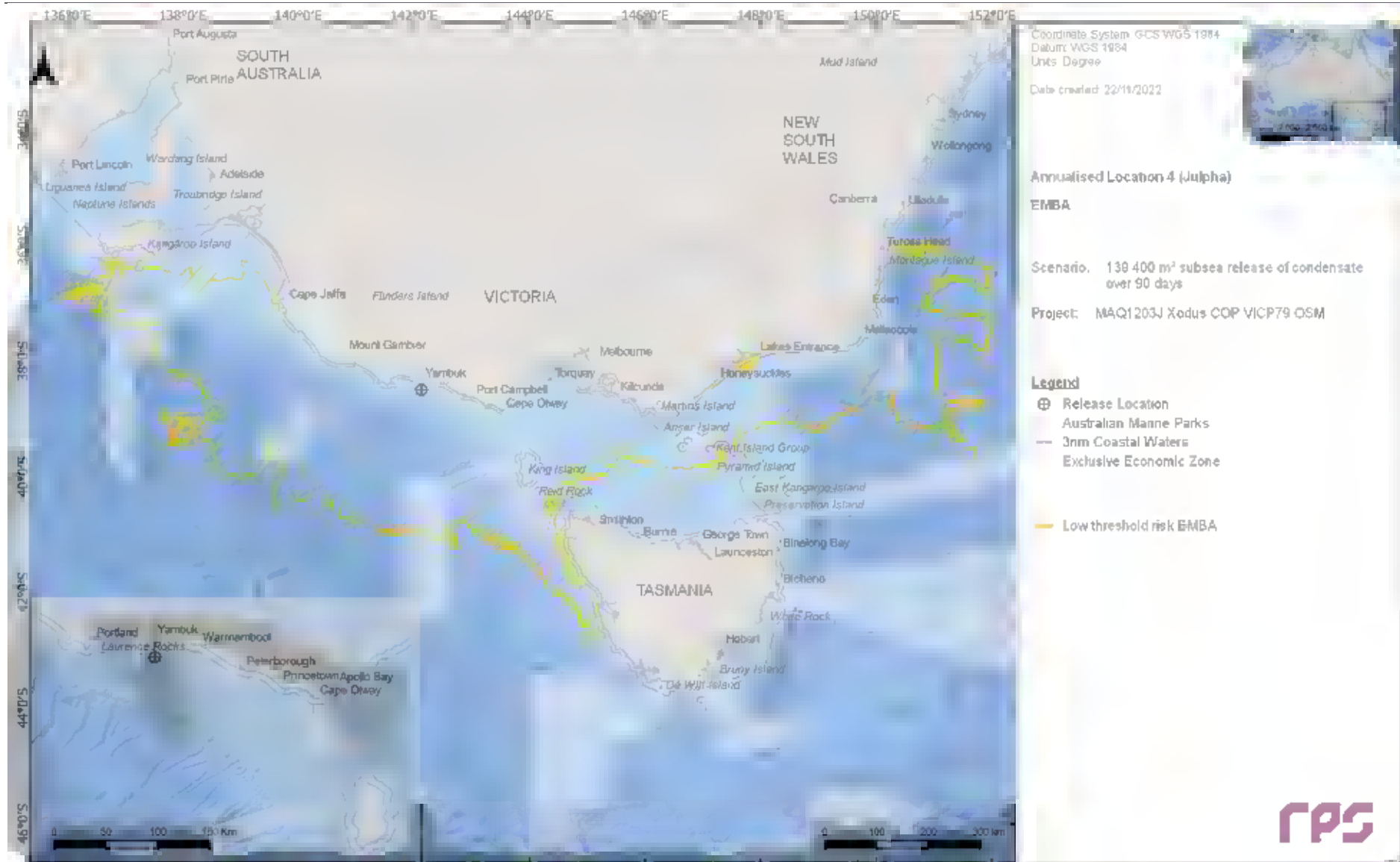


Figure 16.1 Predicted low threshold EMBA from a subsea LOWC at Location 4. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

16.2 Stochastic Analysis

16.2.1 Floating Oil Exposure

Table 16.2 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 16.3 summarises the potential floating oil exposure to individual receptors for each season.

Figure 16.2 to Figure 16.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating hydrocarbon exposure at or above the low exposure threshold of 1,240 km² was identified as run number 50 and commenced during winter conditions, 3 pm 10th May 2018. In comparison the largest swept area of floating hydrocarbon at or above the low exposure threshold occurring during summer was 967 km².

Table 16.1 Maximum distances and directions travelled by floating oil from a subsea LOWC at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	180.9	11.6	0.2
	Maximum distance (km) from release location (99 th percentile)	110.8	11.4	0.2
	Direction	ESE	E	N
Winter	Maximum distance (km) from release location	363.4	12.3	0.2
	Maximum distance (km) from release location (99 th percentile)	121.7	11.7	0.2
	Direction	E	W	N

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Table 16.2 Summary of the potential exposure by floating oil to individual receptors from a subsea LOWC at Location 4 for each season. Results were calculated from 100 spill simulations per season.

Receptor	Summer						Winter						
	Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			
	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	
AMP	Apollo	4	-	-	35.42	-	-	7	-	-	10.67	-	-
	Bridgewater	26	-	-	7.29	-	-	9	-	-	73.17	-	-
	Gippsland Plain	-	-	-	-	-	-	7	-	-	21.96	-	-
	Glenelg Plain	52	-	-	3.83	-	-	18	-	-	23.46	-	-
IBRA	Otway Plain	4	-	-	63.46	-	-	50	-	-	5.29	-	-
	Otway Ranges	3	-	-	20.75	-	-	32	-	-	8.92	-	-
	Warrnambool Plain	93	-	-	1.5	-	-	100	-	-	1.38	-	-
	Wilson's Promontory	-	-	-	-	-	-	6	-	-	22.08	-	-
IMCRA	Central Bass Strait	1	-	-	63.38	-	-	6	-	-	9.46	-	-
	Central Victoria	2	-	-	37.04	-	-	4	-	-	10.67	-	-
	Flinders	-	-	-	-	-	-	11	-	-	21.96	-	-
	Otway	100	100	3	0.04	0.08	1.21	100	100	3	0.04	0.08	10.79
KEF	Bonney Coast Upwelling	100	31	-	0.17	1.29	-	100	47	-	0.17	3.71	-
MNP	Twelve Apostles	23	-	-	2.63	-	-	84	-	-	2.71	-	-
MS	Merri	12	-	-	4.58	-	-	20	-	-	4.88	-	-
	The Arches	5	-	-	20.42	-	-	11	-	-	3.46	-	-
Nearshore Waters	Colac Otway	6	-	-	57.88	-	-	56	-	-	5.29	-	-
	Corangamite	57	-	-	3.67	-	-	96	-	-	2.46	-	-
	Glenelg	55	-	-	3.83	-	-	19	-	-	17.13	-	-
	Lady Julia Percy Island	62	-	-	2.13	-	-	56	-	-	1.46	-	-
	Laurence Rocks	32	-	-	7.25	-	-	15	-	-	24.54	-	-
	Moyne	89	-	-	1.5	-	-	100	-	-	1.46	-	-
	Norman Island	-	-	-	-	-	-	6	-	-	22.08	-	-
	South Gippsland	-	-	-	-	-	-	10	-	-	21.96	-	-
	Warrnambool	63	-	-	3.79	-	-	90	-	-	1.38	-	-

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NPS4	Wilson's Promontory Marine Park	-	-	-	-	-	-	10	-	-	21.96	-	-
State Waters	Victoria	100	1	-	0.71	21.29	-	100	-	-	0.63	-	-

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Figure 16.2 Zones of potential floating oil exposure from a subsea LOWC at Location 4 during summer conditions. The results were calculated from 100 spill simulations.

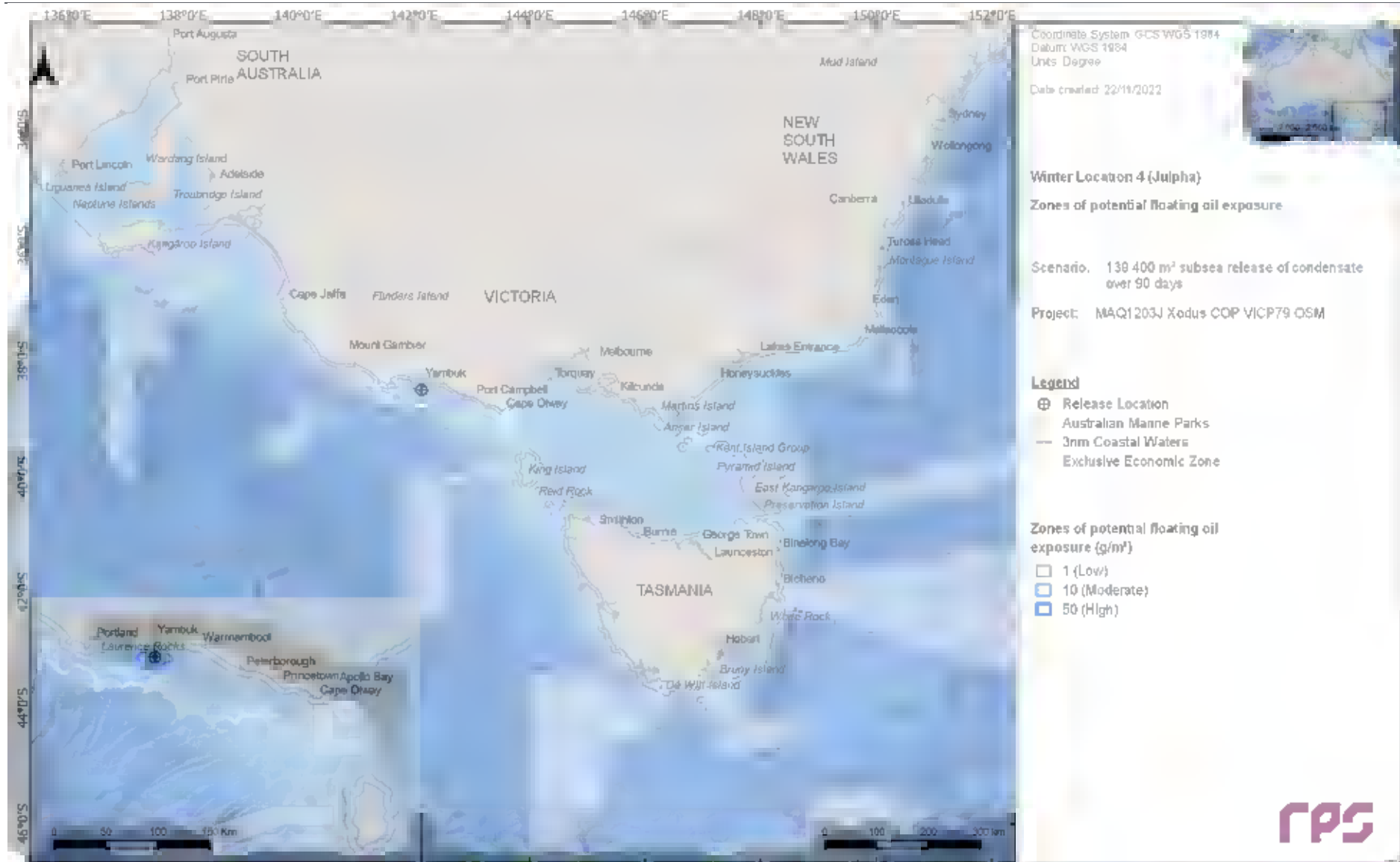


Figure 16.3 Zones of potential floating oil exposure from a subsea LOWC at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

16.2.2 Shoreline Accumulation

Table 16.3 summarises the predicted accumulation on any shoreline during each season.

Table 16.4 and Table 16.5 summarises the accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 16.4 and Figure 16.5.

Table 16.3 Summary of accumulation on any shoreline from a subsea LOWC at Location 4 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	100	100
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	2.17	1.92
Maximum volume of hydrocarbons ashore (m ³)	236.2	318.9
Average volume of hydrocarbons ashore (m ³)	90.8	126.9
Maximum length of the shoreline at 10 g/m² (km)	216	226
Average shoreline length (km) at 10 g/m² (km)	132.6	153.5
Maximum length of the shoreline at 100 g/m² (km)	65	76
Average shoreline length (km) at 100 g/m² (km)	29	38.4
Maximum length of the shoreline at 1,000 g/m² (km)	3	4
Average shoreline length (km) at 1,000 g/m² (km)	1.8	1.8

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Table 16.4 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 4 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	1	-	-	56.79	-	-	11	11	0.1	0.1	1	-	-	1	-	-
Bass Coast	2	-	-	35.17	-	-	18	23	< 0.1	1	1.4	-	-	1.9	-	-
Colac Otway	57	14	-	8.17	19.5	-	29	272	3.4	22.1	13.6	2.9	-	35.4	6.7	-
Corangamite	95	79	-	3.46	4.75	-	53	503	14.1	36.3	24.7	4.3	-	44.9	15.3	-
Glenelg	90	65	2	5.08	7.42	37.04	79	1,154	23.5	94.5	26.4	8.6	1.4	63.1	19.1	1.9
Glennie Group	1	-	-	80.79	-	-	12	12	< 0.1	0.2	1	-	-	1	-	-
Grant	9	-	-	19.92	-	-	12	27	0.1	1.8	2.1	-	-	3.8	-	-
Greater Geelong	1	-	-	78.67	-	-	12	12	0.4	0.4	1	-	-	1	-	-
Hogan Island Group	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Kanowna Island	1	-	-	105.04	-	-	11	11	0.2	0.2	1	-	-	1	-	-
King Island	4	-	-	62.92	-	-	14	19	< 0.1	2.3	2.4	-	-	6.7	-	-
Lady Julia Percy Island	98	67	1	2.17	2.29	83.75	178	1,339	2.1	16.1	1	1	1	1	1	1
Laurence Rocks	80	47	-	4.33	6.92	-	80	583	2.1	9.4	2.8	1.3	-	2.9	2.9	-
Moncoeur Islands	-	-	-	-	-	-	-	-	< 0.1	0.2	-	-	-	-	-	-
Mornington Peninsula	3	-	-	69.5	-	-	15	31	< 0.1	2	4.8	-	-	5.7	-	-
Moynes	100	95	5	2.33	3.25	31.83	81	1,819	43.5	108.6	48.6	11.6	1.3	84.1	25.8	1.9
Norman Island	4	-	-	46.83	-	-	32	48	< 0.1	0.7	1.4	-	-	1.9	-	-
Phillip Island	4	-	-	38.92	-	-	15	22	< 0.1	1.1	1.9	-	-	3.8	-	-
Rodondo Island	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Seal Islands	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Shellback Island	1	-	-	56.38	-	-	27	27	0.3	0.3	1	-	-	1	-	-
Skull Rock	1	-	-	105.04	-	-	11	11	0.2	0.2	1	-	-	1	-	-
South Gippsland	4	-	-	46.79	-	-	21	53	0.3	8.1	19.4	-	-	25.8	-	-

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Surf Coast	4	-	-	31.17	-	-	14	24	< 0.1	1.5	2.4	-	-	3.8	-	-
Warrnambool	99	74	1	3.29	4.25	36.58	85	1,566	21.2	121.9	18.7	8.1	2.9	28.7	17.2	2.9
Wattle Range	4	-	-	42.38	-	-	12	17	< 0.1	1.3	2.9	-	-	3.8	-	-

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Table 16.5 Summary of accumulation on individual shoreline sectors from a subsea LOWC at Location 4 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	33	-	-	22.88	-	-	18	37	0.1	0.6	1.1	-	-	1.9	-	-
Bass Coast	24	1	-	21.79	109.75	-	16	105	0.3	3.5	2.3	1	-	6.7	1	-
Colac Otway	99	66	-	5.08	14.08	-	47	471	11.5	42.8	22	4.1	-	47.8	11.5	-
Corangamite	100	96	-	3.75	4.83	-	85	961	32.4	96.2	34.4	9.6	-	52.6	20.1	-
Glenelg	59	23	-	6.08	18.17	-	55	964	8.1	63.8	15.9	8.2	-	51.6	21	-
Glennie Group	29	-	-	22.46	-	-	15	59	0.2	1.7	2.3	-	-	5.7	-	-
Grant	2	-	-	81.25	-	-	12	15	< 0.1	1.3	3.3	-	-	4.8	-	-
Greater Geelong	-	-	-	-	-	-	-	-	< 0.1	0.5	-	-	-	-	-	-
Hogan Island Group	3	-	-	87.21	-	-	14	16	< 0.1	0.4	1	-	-	1	-	-
Kanowna Island	35	-	-	19.17	-	-	18	41	0.2	0.7	1.4	-	-	2.9	-	-
King Island	8	-	-	18.54	-	-	14	37	0.2	3.1	2.7	-	-	10.5	-	-
Lady Julia Percy Island	91	50	9	3	3.25	3.63	227	1,617	2.5	19.5	1	1	1	1	1	1
Laurence Rocks	51	13	-	3.54	28	-	54	267	0.9	6	2.6	2.1	-	2.9	2.9	-
Moncoeur Islands	8	-	-	28.75	-	-	19	27	< 0.1	0.5	1.3	-	-	1.9	-	-
Mornington Peninsula	15	-	-	21.96	-	-	17	44	0.2	2	2.5	-	-	4.8	-	-
Moyne	100	100	16	2.21	3.38	16.96	111	1,578	59.3	176.9	48	14.2	1.6	77.4	25.8	2.9
Norman Island	42	6	-	20.88	21.92	-	32	191	0.5	5.2	2	2.1	-	4.8	2.9	-
Phillip Island	17	-	-	19.21	-	-	14	38	0.2	1.3	1.9	-	-	4.8	-	-
Rodondo Island	12	-	-	28.54	-	-	18	36	< 0.1	0.4	1	-	-	1	-	-
Seal Islands	1	-	-	59.75	-	-	10	10	0.4	0.4	1	-	-	1	-	-
Shellback Island	20	-	-	22.54	-	-	19	60	< 0.1	0.7	1	-	-	1	-	-
Skull Rock	35	-	-	19.17	-	-	19	41	0.1	0.6	1.3	-	-	1.9	-	-
South Gippsland	63	12	-	18.88	22.21	-	21	220	2.5	17.6	10.3	2.4	-	37.3	3.8	-

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Surf Coast	10	-	-	18.75	-	-	19	40	0.2	1.4	2.3	-	-	3.8	-	-
Warrnambool	97	88	2	1.92	3	32.5	108	1,563	27.3	125.3	20.6	8.6	2.9	28.7	18.2	2.9
Wattle Range	2	-	-	81.08	-	-	13	15	< 0.1	1.1	1.4	-	-	1.9	-	-

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Figure 16.4 Maximum potential shoreline loading from a subsea LOWC at Location 4 during summer conditions. The results were calculated from 100 spill simulations.



Figure 16.5 Maximum potential shoreline loading from a subsea LOWC at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

16.2.3 In-water exposure

16.2.3.1 Dissolved Hydrocarbons

Table 16.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 16.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 16.6 and Figure 16.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 16.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	626	456	264
	Maximum distance (km) from release location (99 th percentile)	457	339	200
	Direction	E	E	WNW
Winter	Maximum distance (km) from release location	686	403	221
	Maximum distance (km) from release location (99 th percentile)	433	281	188
	Direction	E	E	E

Table 16.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer					Winter			
	Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			
		Low	Mod erate	High		Low	Mode rate	High	
AMP	Apollo	1,753	58	34	8	2,091	92	81	19
	Beagle	140	5	2	-	51	6	1	-
	Franklin	18	2	-	-	2	-	-	-
	Murray	40	2	-	-	11	1	-	-
	Nelson	390	19	12	-	374	5	3	-
	Zeehan	220	13	5	-	250	5	2	-
IBRA	Bridgewater	1,611	88	80	33	2,144	53	37	9
	Flinders	37	4	-	-	19	2	-	-
	Gippsland Plain	124	6	2	-	167	13	3	-
	Glenelg Plain	2,434	95	91	69	3,306	67	60	27
	King Island	17	1	-	-	78	2	1	-
	Otway Plain	2,430	67	53	17	2,542	99	95	51
	Otway Ranges	2,476	76	59	22	3,809	100	98	78
	Strzelecki Ranges	82	5	1	-	47	6	-	-
	Warrnambool Plain	6,709	100	100	93	5,083	100	100	100
	Wilson's Promontory	94	7	1	-	65	10	1	-
IMCRA	Central Bass Strait	1,544	45	23	4	2,033	85	68	8
	Central Victoria	1,374	52	32	5	1,954	92	77	14
	Coorong	291	17	6	-	124	5	2	-
	Flinders	160	9	2	-	71	11	1	-
	Franklin	21	1	-	-	9	-	-	-
	Otway	8,435	100	100	100	8,029	100	100	100
	Twofold Shelf	66	5	1	-	47	5	-	-
Victorian Embayments	25	2	-	-	88	6	1	-	
KEF	Bonney Coast Upwelling	8,268	100	100	100	6,042	100	100	100
	Upwelling East of Eden	17	2	-	-	16	1	-	-
	West Tasmania Canyons	574	26	12	1	335	12	4	-
MNP	Bunurong	26	3	-	-	112	7	2	-
	Churchill Island	10	-	-	-	30	2	-	-
	Discovery Bay	1,368	86	77	22	1,737	40	27	5
	Point Addis	177	3	1	-	61	11	1	-

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	Port Phillip Heads	20	2	-	-	19	2	-	-
	Twelve Apostles	6,355	95	89	67	4,998	100	100	98
	Wilson's Promontory	73	7	1	-	60	9	1	-
MS	Marengo Reefs	318	29	11	-	580	82	48	2
	Merri	1,115	100	96	38	1,931	100	98	49
	Mushroom Reef	14	1	-	-	88	4	1	-
	The Arches	2,815	96	92	61	2,932	100	100	88
Nearshore Waters	Anser Island	53	7	1	-	42	7	-	-
	Bass Coast	33	2	-	-	44	6	-	-
	Colac Otway	2,476	73	54	17	3,809	99	97	59
	Corangamite	6,709	97	97	93	4,782	100	100	100
	Curtis Island	10	1	-	-	19	1	-	-
	Gleneleg	2,434	95	91	69	3,306	67	60	27
	Glennie Group	78	7	1	-	65	10	1	-
	Grant	212	26	11	-	106	6	1	-
	Greater Geelong	42	3	-	-	41	2	-	-
	Hogan Island Group	37	4	-	-	16	2	-	-
	Kanowna Island	61	7	1	-	42	7	-	-
	King Island	17	1	-	-	78	2	1	-
	Lady Julia Percy Island	3,110	100	99	83	4,034	98	96	73
	Laurence Rocks	2,602	95	93	74	2,746	73	69	35
	Moncoeur Islands	61	3	1	-	26	6	-	-
	Mornington Peninsula	40	3	-	-	167	11	3	-
	Moyne	6,675	100	100	93	5,083	100	100	100
	Mud Island	4	-	-	-	13	1	-	-
	Norman Island	59	6	1	-	31	5	-	-
	Phillip Island	40	2	-	-	90	12	2	-
	Rodondo Island	94	3	1	-	33	8	-	-
	Seal Islands	21	1	-	-	18	1	-	-
	Shellback Island	67	4	1	-	22	4	-	-
	Skull Rock	54	5	1	-	59	8	1	-
	South Gippsland	124	7	2	-	62	9	1	-
	Surf Coast	126	4	1	-	70	15	2	-
	Warrnambool	3,505	100	100	71	2,980	100	100	80
Wattle Range	58	3	1	-	20	1	-	-	
NPS4	Bunurong Marine Park	33	2	-	-	27	6	-	-
	Corner Inlet Marine and Coastal Park	11	1	-	-	10	-	-	-

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	Wilsons Promontory Marine Park	67	4	1	-	22	3	-	-
	Wilsons Promontory Marine Reserve	49	7	-	-	33	7	-	-
	Corner Inlet	11	1	-	-	10	-	-	-
	Glenelg Estuary and Discovery Bay Wetlands	349	43	12	-	173	6	3	-
Ramsar	Piccaninnie Ponds Karst Wetlands	51	11	1	-	40	3	-	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	14	1	-	-	9	-	-	-
	Western Port	10	-	-	-	30	2	-	-
RSB	Bravenes Rock	816	67	49	3	1,408	99	91	26
	Cody Bank	87	8	2	-	56	12	1	-
	Cutter Rock	19	1	-	-	14	3	-	-
State Waters	South Australia	376	37	18	-	239	7	4	-
	Tasmania	66	5	1	-	206	4	1	-
	Victoria	6,709	100	100	100	6,606	100	100	100

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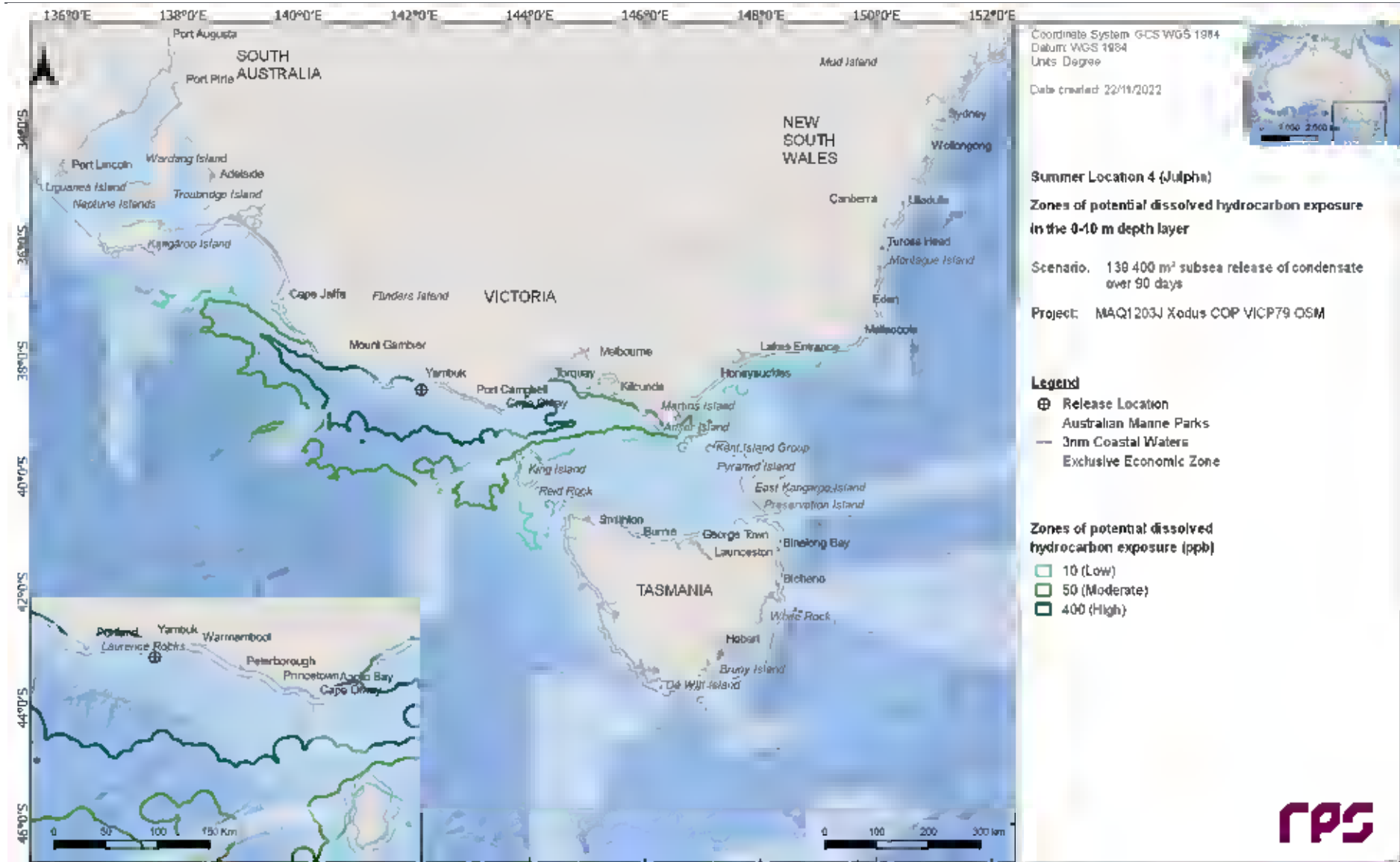


Figure 16.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 4 during summer conditions. The results were calculated from 100 spill simulations.

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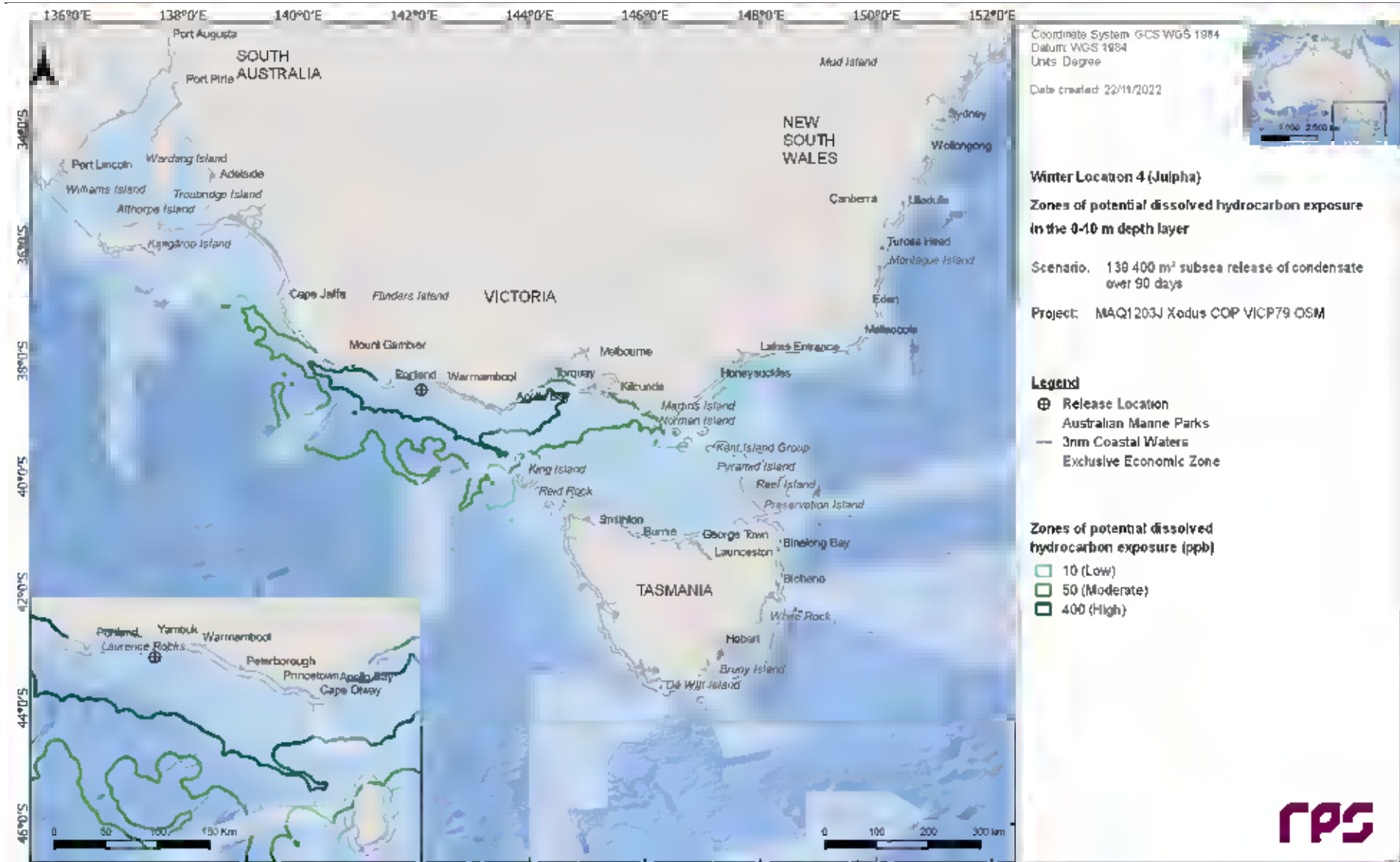


Figure 16.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

16.2.3.2 Entrained Hydrocarbons

Table 16.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 16.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 16.8 and Figure 16.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 16.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a subsea LOWC at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	902	426
	Maximum distance (km) from release location (99 th percentile)	851	328
	Direction	ENE	E
Winter	Maximum distance (km) from release location	877	408
	Maximum distance (km) from release location (99 th percentile)	832	367
	Direction	E	E

Table 16.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a subsea LOWC at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	586	78	43	781	99	91
	Beagle	102	32	1	126	72	4
	East Gippsland	14	2	-	26	15	-
	Franklin	17	6	-	13	3	-
	Murray	43	22	-	15	2	-
	Nelson	70	27	-	77	11	-
	Zeehan	209	28	7	181	34	4
IBRA	Bateman	13	1	-	22	7	-
	Bridgewater	1,781	92	88	1,552	62	46
	East Gippsland Lowlands	30	8	-	30	31	-
	Flinders	98	16	-	74	47	-
	Gippsland Plain	140	33	3	319	79	11
	Glenelg Plain	2,683	96	91	1,976	69	60
	King Island	99	20	-	101	34	1
	Otway Plain	907	85	65	1,209	99	99
	Otway Ranges	965	90	76	1,133	100	99
	South East Coastal Ranges	6	-	-	12	6	-
	Strzelecki Ranges	73	26	-	155	77	9
	Tasmanian West	12	4	-	10	1	-
	Warrnambool Plain	3,047	100	100	3,167	100	100
	Wilson's Promontory	126	33	2	342	81	30
	IMCRA	Batemans Shelf	39	8	-	38	14
Central Bass Strait		541	73	34	630	97	82
Central Victoria		515	77	39	697	99	91
Coorong		112	42	1	34	7	-
Eyre		13	2	-	3	0	-
Flinders		126	33	3	345	82	30
Franklin		26	11	-	13	2	-
Otway		11,151	100	100	12,086	100	100
Twofold Shelf		103	26	1	85	67	-
KEF	Victorian Embayments	111	29	3	116	73	2
	Ancient coastline at 90-120 m depth	13	2	-	2	-	-
	Big Horseshoe Canyon	36	11	-	22	20	-
	Bonney Coast Upwelling	4,849	100	100	4,530	100	100
	Canyons on the eastern continental slope	46	6	-	19	6	-

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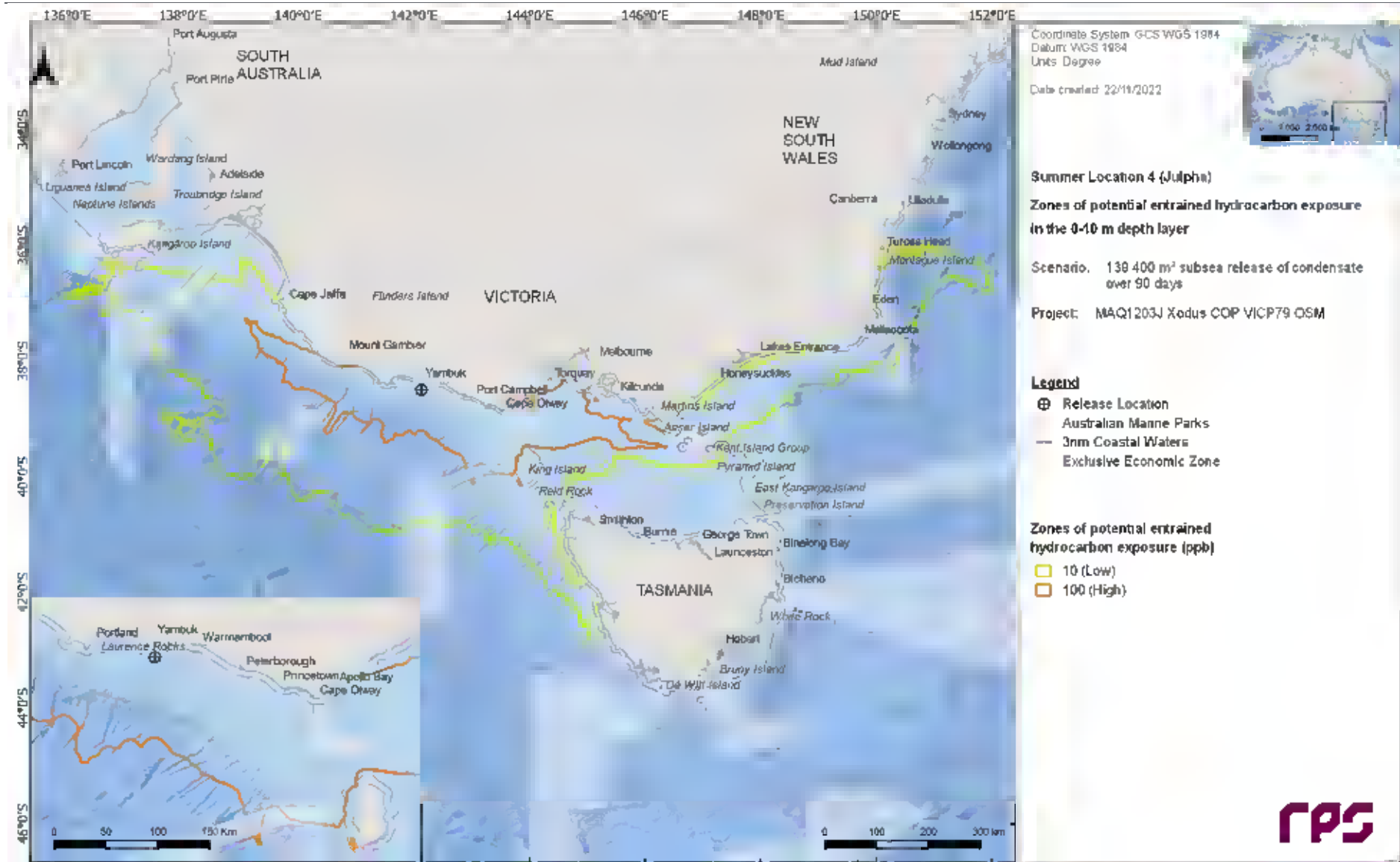
	Kangaroo Island Pool, canyons and adjacent shelf break, and Eyre Peninsula upwellings	13	2	-	3	-	-
	Shelf rocky reefs	16	7	-	27	8	-
	Upwelling East of Eden	87	13	-	56	48	-
	West Tasmania Canyons	252	52	15	235	51	15
	Bunurong	63	30	-	115	76	2
	Cape Howe	39	8	-	30	33	-
	Churchill Island	32	18	-	67	67	-
	Discovery Bay	479	92	80	551	56	30
	French Island	7	-	-	12	3	-
MNP	Ninety Mile Beach	4	-	-	10	1	-
	Point Addis	58	34	-	53	88	-
	Point Hicks	20	6	-	29	35	-
	Port Phillip Heads	97	28	-	85	57	-
	Twelve Apostles	1,754	97	94	1,785	100	100
	Wilson's Promontory	126	33	2	301	81	30
	Batemans	15	5	-	28	9	-
MP	Lower South East	101	56	1	94	10	-
	Southern Kangaroo Island	13	3	-	1	-	-
	Upper South East	32	19	-	26	2	-
	Beware Reef	5	-	-	15	4	-
	Marengo Reefs	227	69	20	301	98	60
MS	Merri	2,541	100	100	2,629	100	98
	Mushroom Reef	55	27	-	80	68	-
	The Arches	1,185	97	93	998	100	100
	Anser Island	118	31	1	210	76	29
	Bass Coast	49	27	-	193	74	6
	Bega Valley	30	8	-	30	27	-
	Colac Otway	907	89	70	1,209	100	99
	Corangamite	2,123	98	97	2,441	100	100
	Curtis Island	92	16	-	65	31	-
	East Gippsland	29	7	-	27	27	-
	Eurobodalla	8	-	-	15	6	-
	French Island	18	12	-	42	45	-
	Gabo Island	31	7	-	27	31	-
Nearshore Waters	Glenelg	2,683	96	91	1,976	69	60
	Glennie Group	126	31	2	289	81	29
	Grant	136	54	4	133	9	2
	Greater Geelong	83	27	-	79	53	-
	Hogan Island Group	98	16	-	74	47	-
	Kanowna Island	113	33	1	192	76	30
	Kent Island Group	28	8	-	22	12	-
	King Island	99	20	-	101	34	1
	Lady Julia Percy Island	3,072	100	100	3,080	99	95
	Laurence Rocks	2,253	98	93	2,215	78	68
	Moncoeur Islands	85	31	-	110	71	4

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	Montague Island	13	1	-	22	7	-
	Mornington Peninsula	140	32	3	127	75	7
	Moyne	3,047	100	100	3,167	100	100
	Mud Island	58	17	-	59	28	-
	Norman Island	111	30	2	331	80	19
	Phillip Island	78	33	-	140	79	2
	Reid Rock	9	-	-	11	1	-
	Robe	29	14	-	22	2	-
	Rodondo Island	94	32	-	123	72	11
	Seal Islands	30	14	-	48	56	-
	Shellback Island	82	30	-	306	81	11
	Skull Rock	112	33	1	176	78	30
	South Gippsland	112	31	1	343	78	26
	Surf Coast	52	38	-	88	88	-
	Warrnambool	2,853	100	100	2,939	100	100
	Wattle Range	85	32	-	94	3	-
	Wellington	7	-	-	11	2	-
	West Coast	12	4	-	10	1	-
NP	Kent Group	36	8	-	22	12	-
	Bunurong Marine Park	45	27	-	176	73	5
	Corner Inlet Marine and Coastal Park	28	12	-	81	62	-
	Nooramunga Marine and Coastal Park	5	-	-	10	1	-
NPS4	Shallow Inlet Marine and Coastal Park	29	12	-	46	58	-
	Wilsons Promontory Marine Park	85	30	-	324	79	12
	Wilsons Promontory Marine Reserve	113	30	2	270	81	25
	Corner Inlet	28	12	-	81	62	-
	Glenelg Estuary and Discovery Bay Wetlands	244	74	28	94	19	-
	Lavinia	12	1	-	20	8	-
Ramsar	Piccaninnie Ponds Karst Wetlands	57	40	-	26	5	-
	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	51	17	-	56	30	-
	Western Port	32	19	-	62	64	-
	Bell Reef	12	4	-	11	3	-
	Beware Reef	5	-	-	15	4	-
RSB	Bravenes Rock	724	84	65	807	99	96
	Cody Bank	49	28	-	121	78	6
	Cutter Rock	64	30	-	103	56	1
	New Zealand Star Bank	47	10	-	30	42	-
State Waters	New South Wales	34	11	-	33	33	-
	South Australia	168	59	9	151	13	2
	Tasmania	108	23	1	114	50	1

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Victoria	3,851	100	100	3,580	100	100
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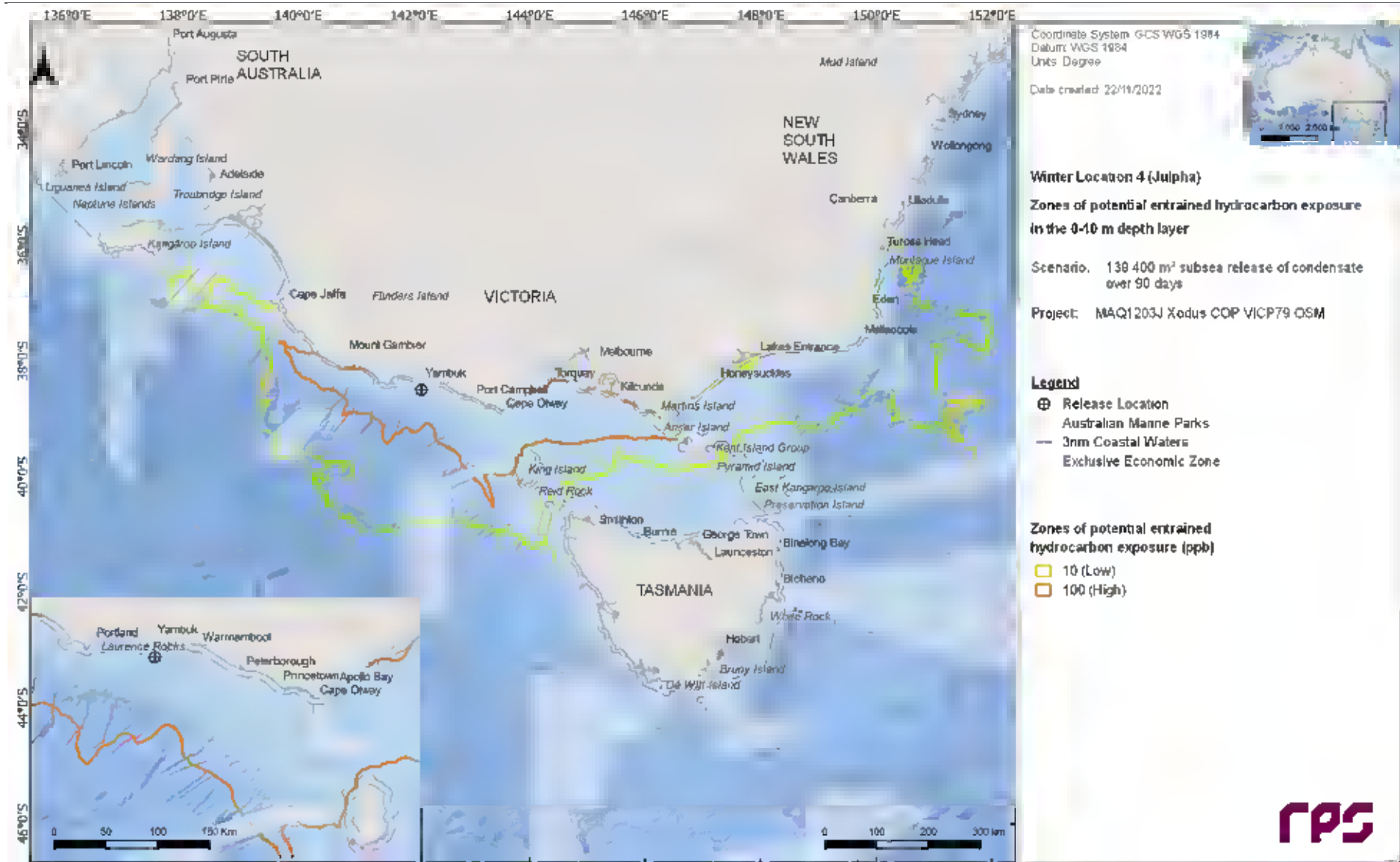


Figure 16.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a subsea LOWC at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

16.3 Deterministic Analysis

16.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 4 pm 6th August 2010.

Figure 16.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days). Initial shoreline accumulation occurred on day 5.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 16.11 and Figure 16.12, respectively.

Figure 16.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 76,490 m³ (~55%) was lost to the atmosphere through evaporation. Approximately, 60,720 m³ (~44%) of the released volume decayed, while approximately 2,030 m³ (~1%) was predicted to remain within the water column and approximately 250 m³ (~0.2%) was present on the shorelines.

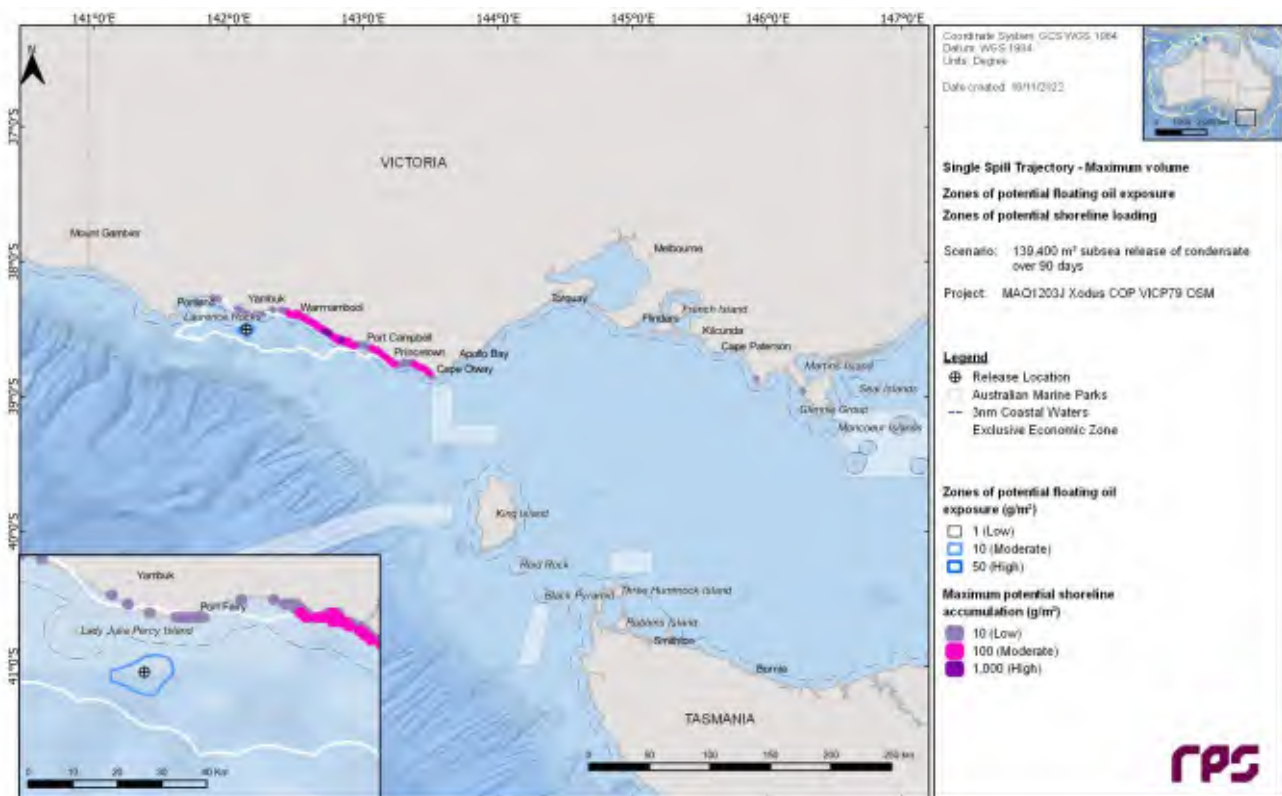


Figure 16.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 4.

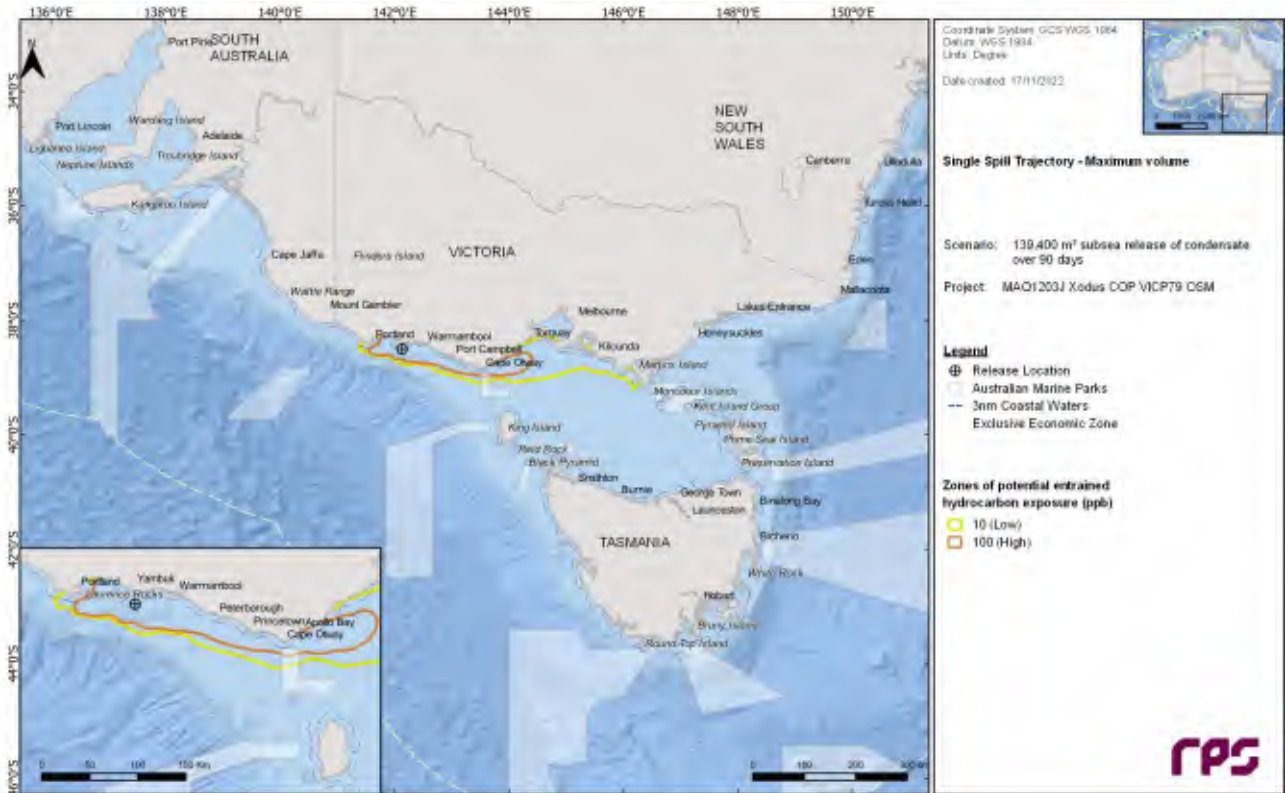


Figure 16.11 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 4.

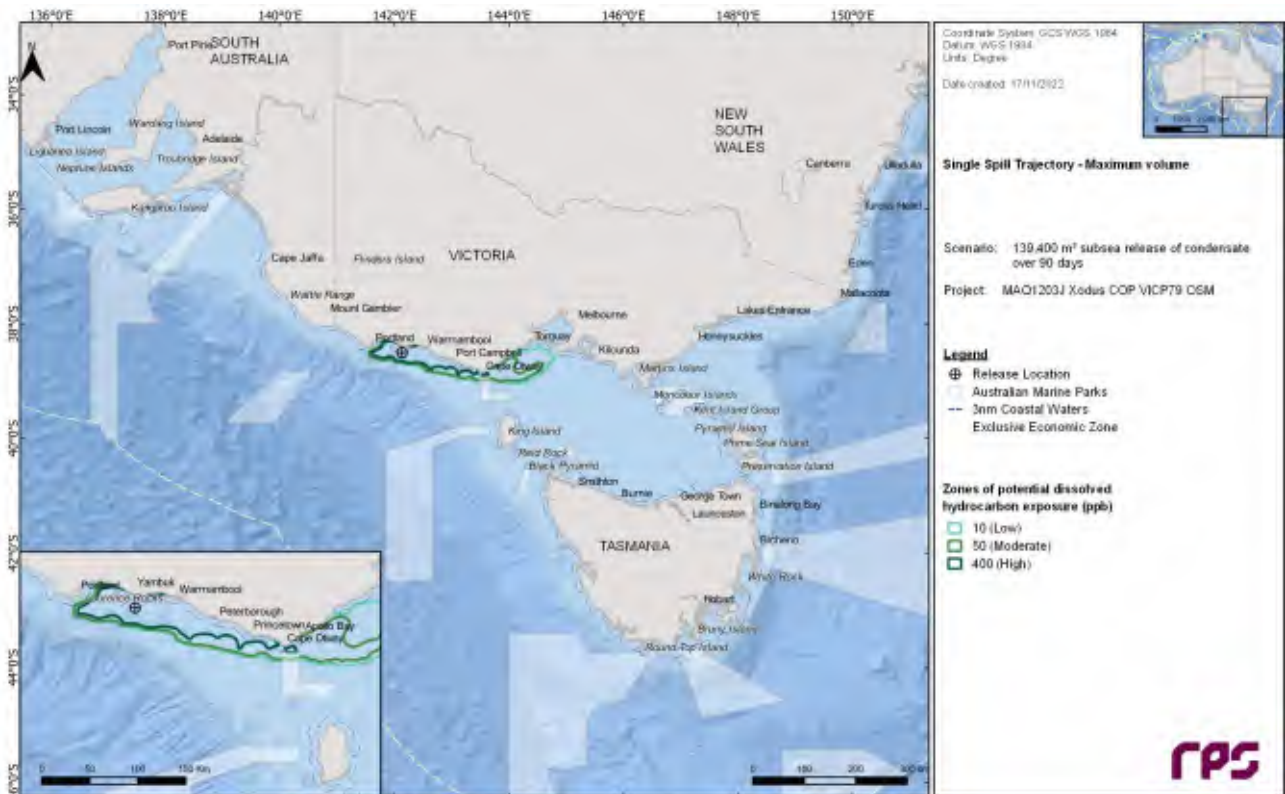


Figure 16.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days of the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 4.

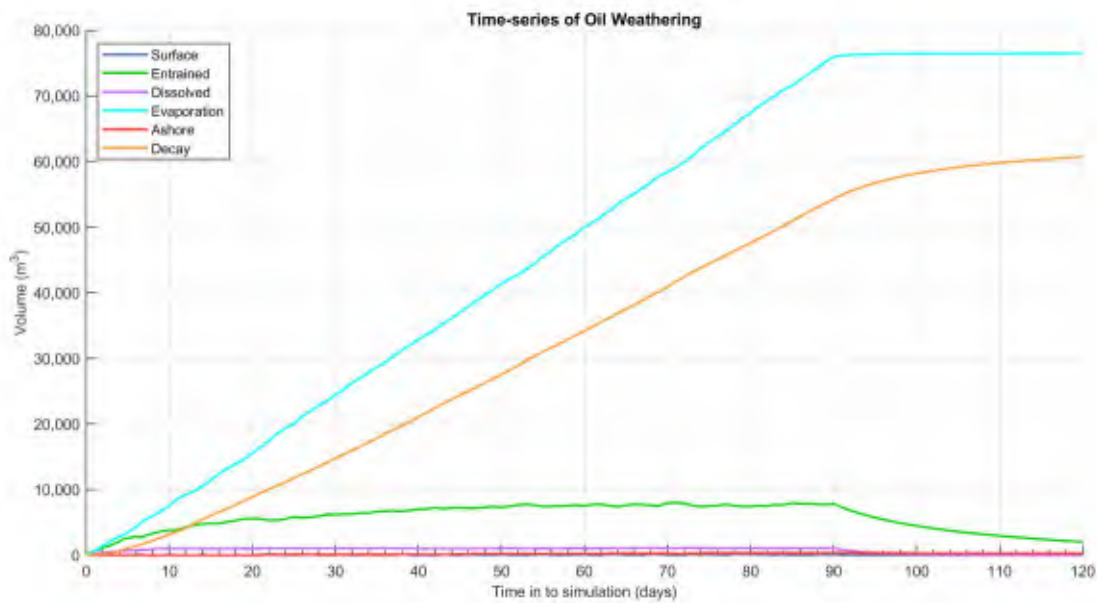


Figure 16.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a subsea LOWC at Location 4.

16.3.2 Minimum time to Shoreline Accumulation

The simulation that resulted in the minimum time to hydrocarbons ashore of 1.92 days was identified as run number 23 which commenced during winter conditions, 12 pm 16th July 2014.

Figure 16.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (120 days).

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 16.15 and Figure 16.16, respectively.

Figure 16.17 presents the fates and weathering graph for the corresponding simulation. At the conclusion of the simulation (day-120), approximately 75,180 m³ (~54%) was lost to the atmosphere through evaporation. Approximately, 58,100 m³ (~42%) of the released volume decayed, while approximately 1,940 m³ (~1%) was predicted to remain within the water column and approximately 105 m³ (<0.1%) remained on shorelines.

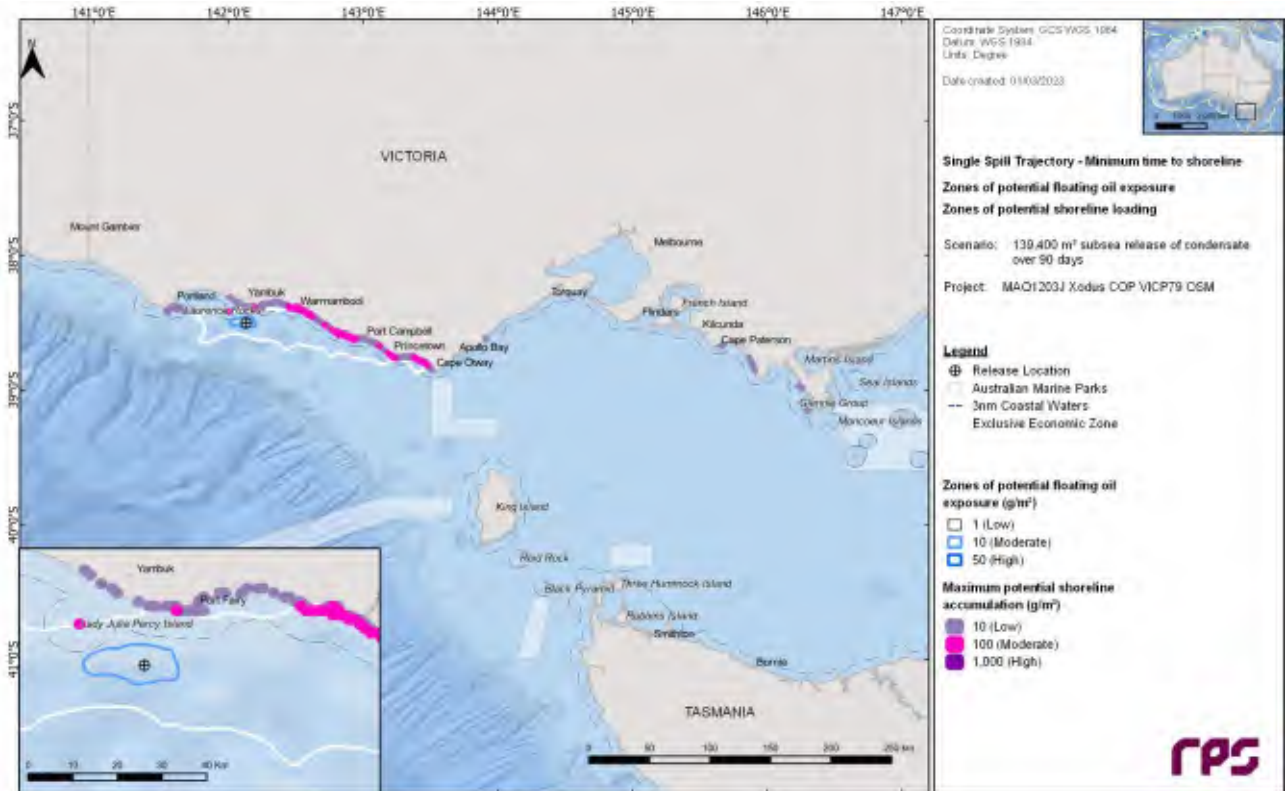


Figure 16.14 Predicted extent of the floating oil exposure and shoreline loading over the entire 120 days for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 4.

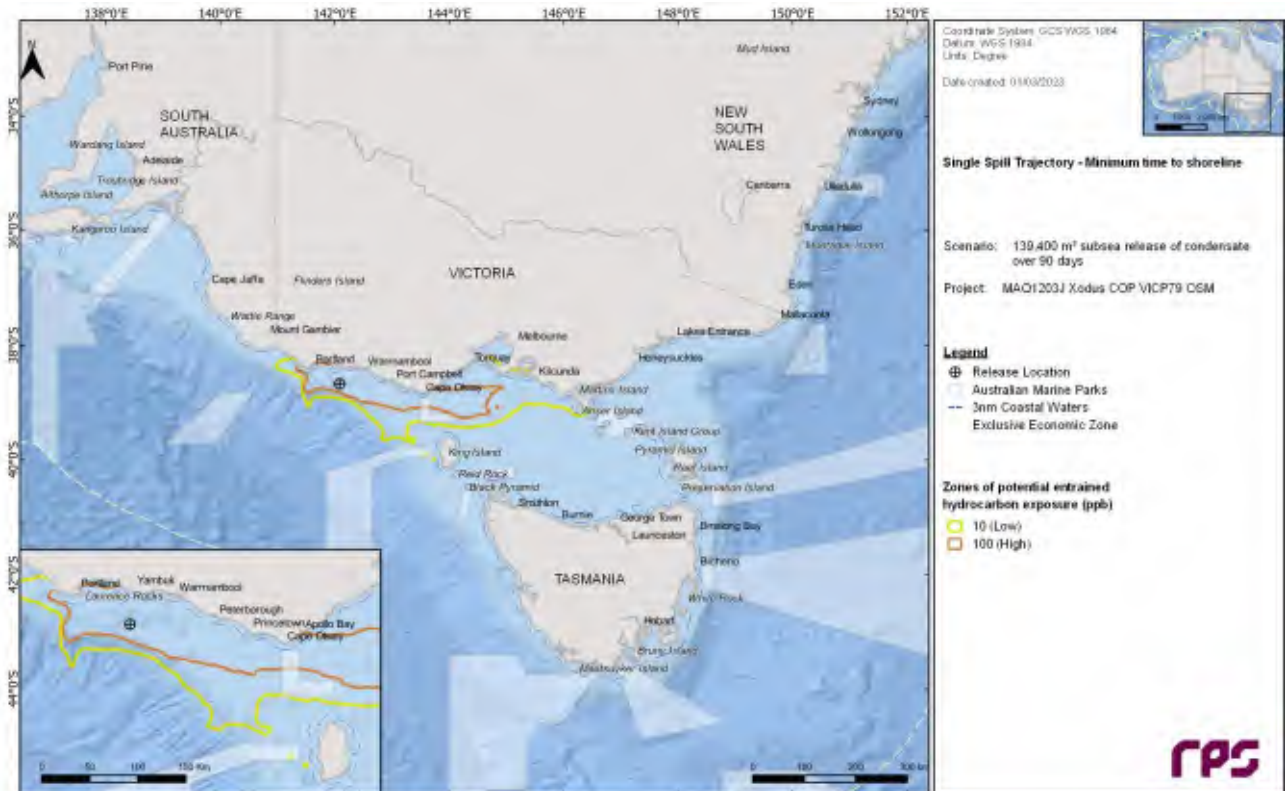


Figure 16.15 Predicted extent of the entrained hydrocarbons exposure over the entire 120 days for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 4.

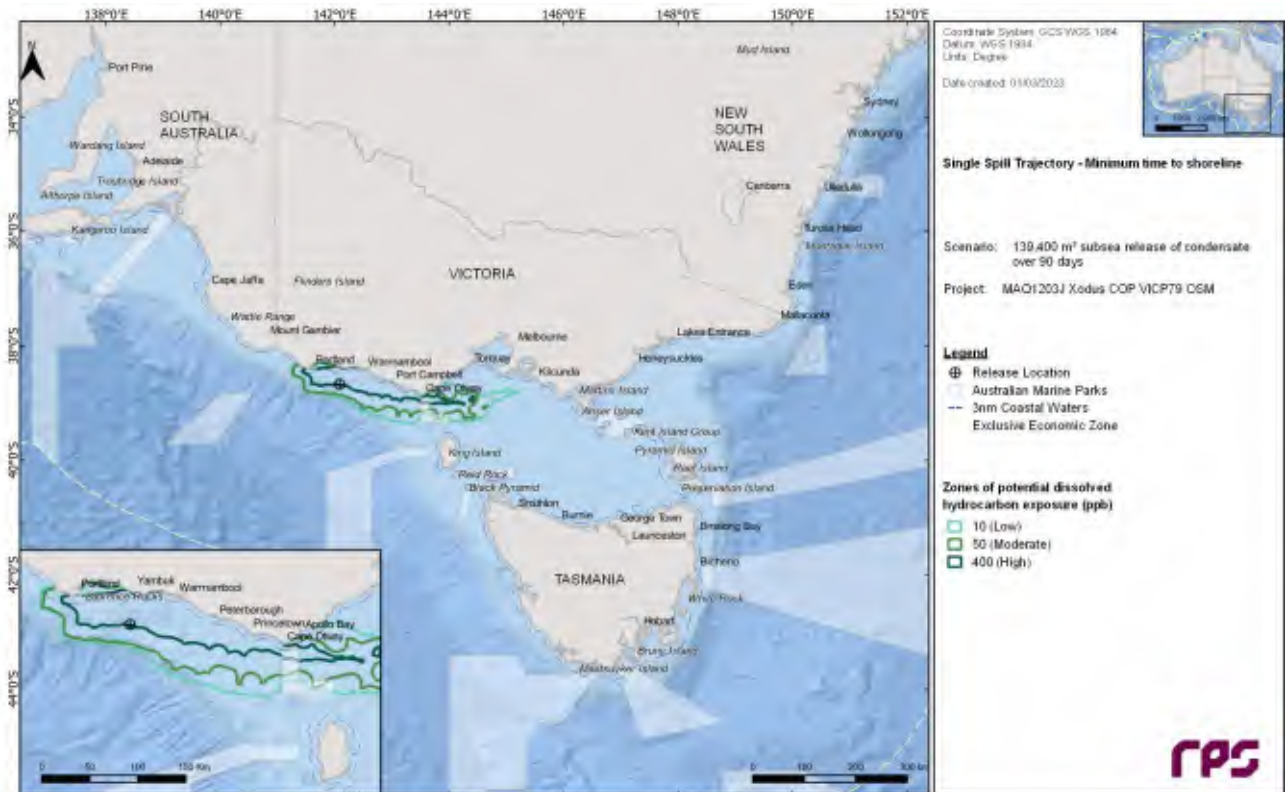


Figure 16.16 Predicted extent of the dissolved hydrocarbons exposure over the entire 120 days for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 4.

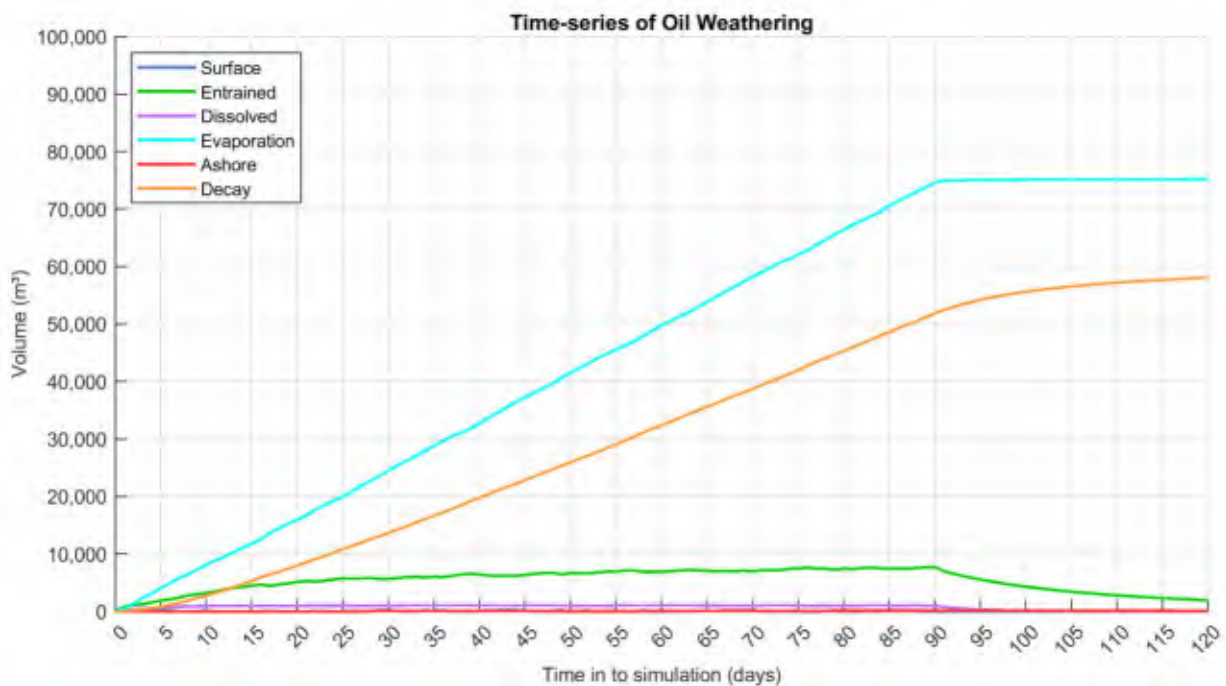


Figure 16.17 Predicted weathering and fates for the simulation that led to the minimum time to shoreline accumulation from a subsea LOWC at Location 4.

17 LOCATION 1 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 1. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 17.1 presents the EMBA, Section 17.2 shows the seasonal (or stochastic) results, while Section 17.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

17.1 EMBA

Figure 17.1 shows the EMBA for Location 1. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

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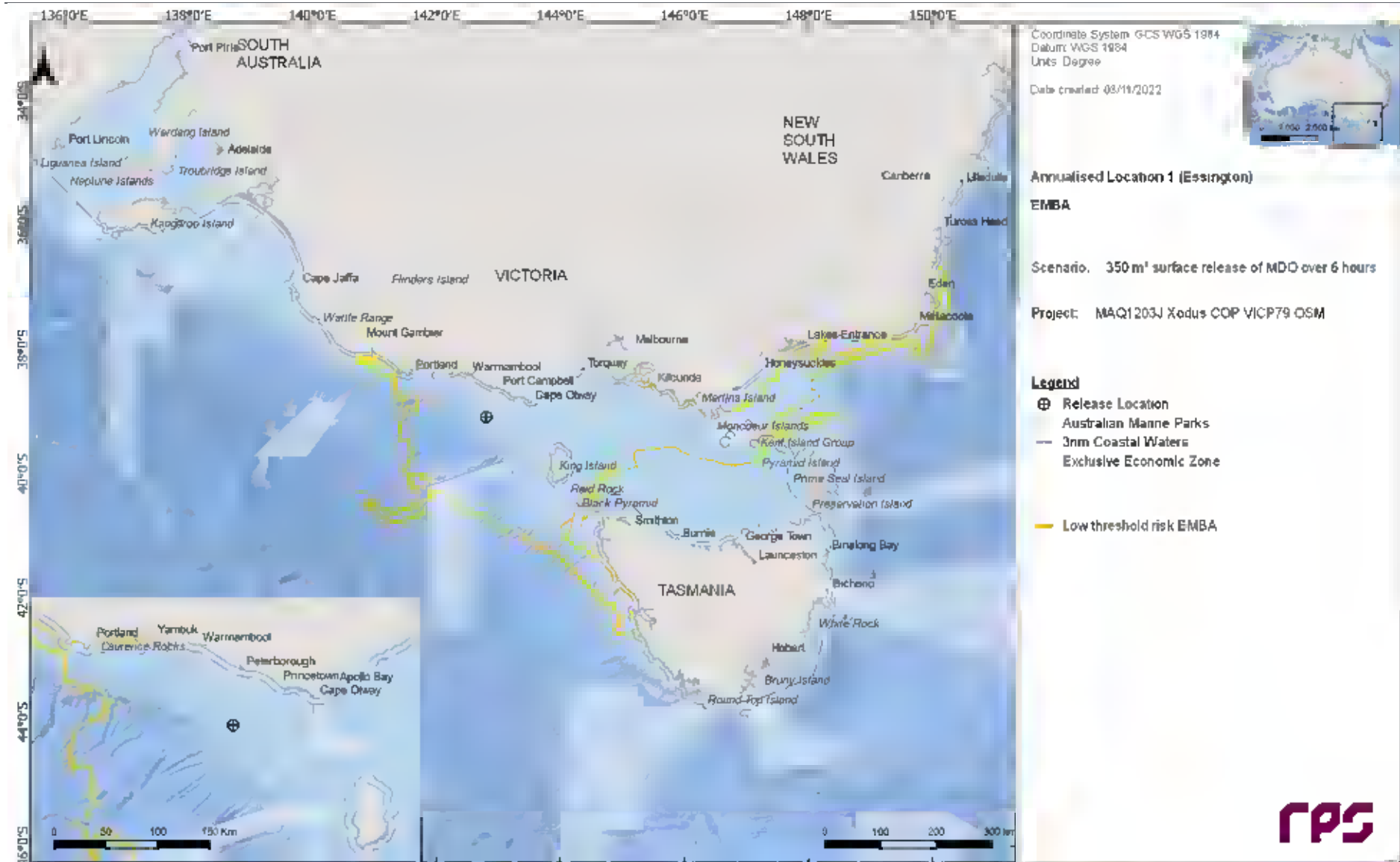


Figure 17.1 Predicted low threshold EMBA from a vessel collision at Location 1. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

17.2 Stochastic Analysis

17.2.1 Floating Oil Exposure

Table 17.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 17.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 17.2 to Figure 17.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 201.6 km² and 122.2 km², respectively.

Table 17.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	27.9	12.6	4.3
	Maximum distance (km) from release location (99 th percentile)	24.5	12.2	4.3
	Direction	W	ESE	ENE
Winter	Maximum distance (km) from release location	52.8	15.9	3.5
	Maximum distance (km) from release location (99 th percentile)	46.1	15.3	3.5
	Direction	E	SSE	NE

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Table 17.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 1 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
IMCRA	Otway	100	100	23	0.04	0.04	0.04	100	100	19	0.04	0.04	0.08

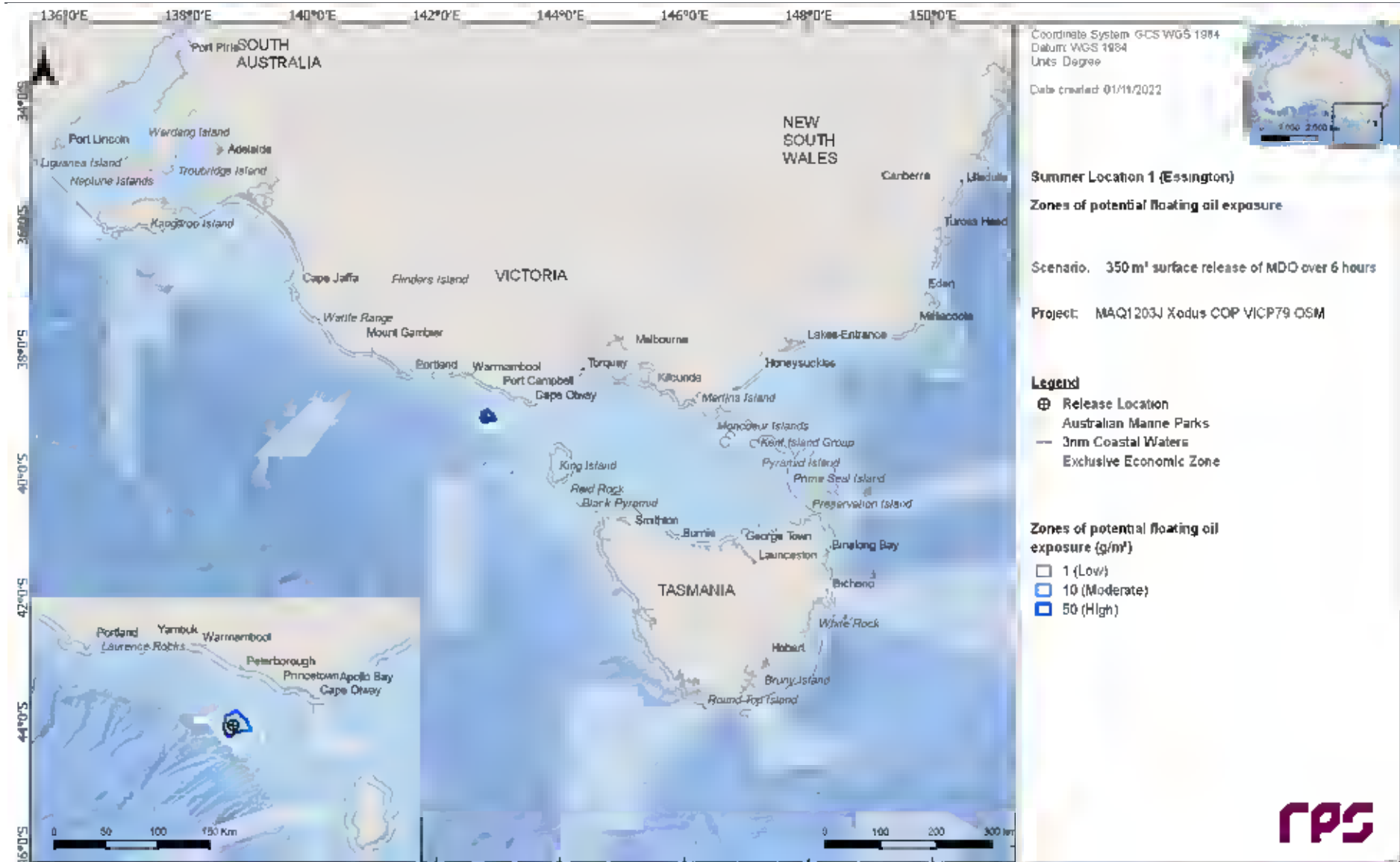


Figure 17.2 Zones of potential floating oil exposure from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

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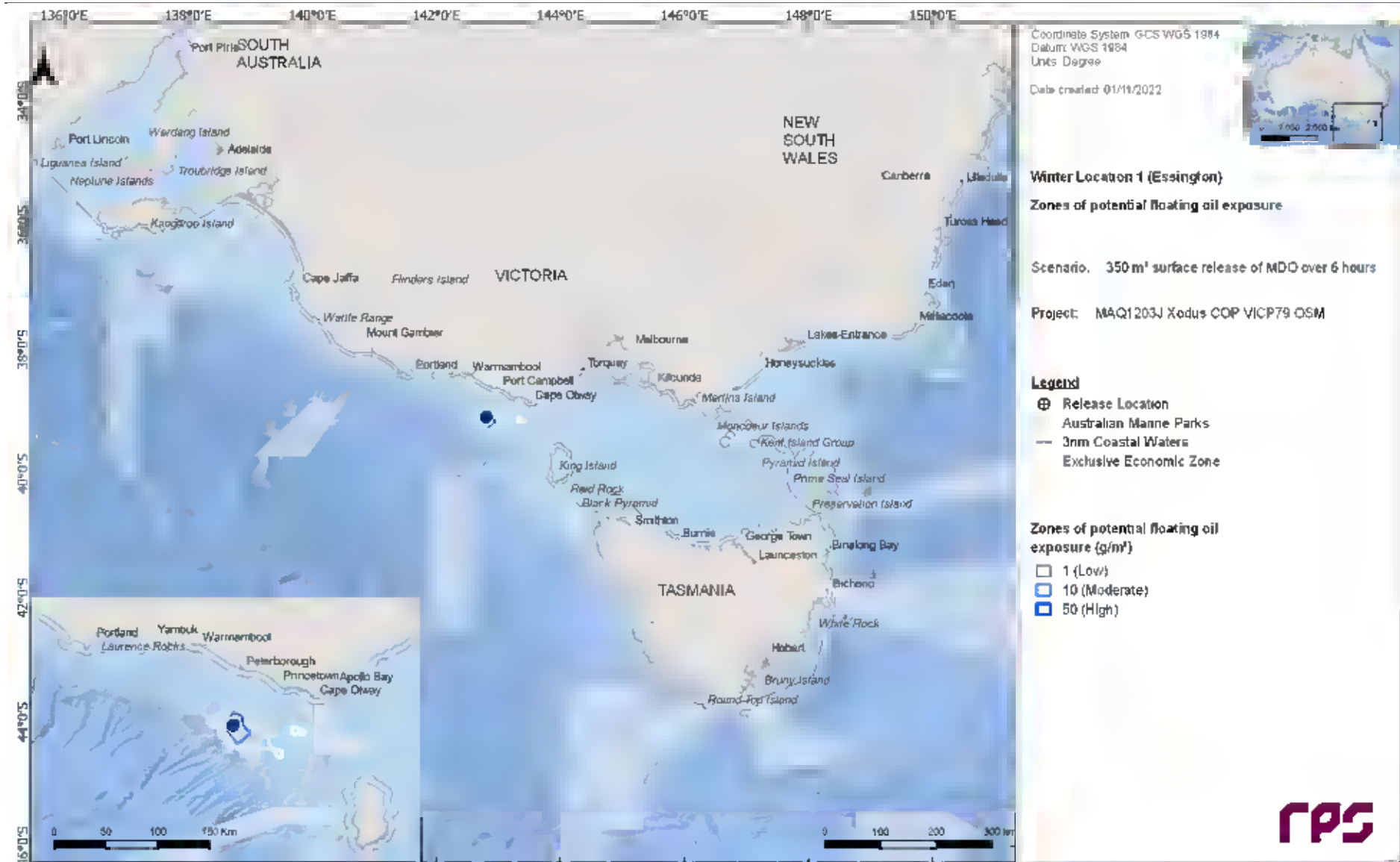


Figure 17.3 Zones of potential floating oil exposure from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

17.2.2 Shoreline Accumulation

Table 17.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 17.4 and Table 17.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 17.4 and Figure 17.5.

Table 17.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 1 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	17	29
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	4.83	5.00
Maximum volume of hydrocarbons ashore (m ³)	6.1	16.6
Average volume of hydrocarbons ashore (m ³)	2.3	3
Maximum length of the shoreline at 10 g/m² (km)	14	30
Average shoreline length (km) at 10 g/m² (km)	5.9	7
Maximum length of the shoreline at 100 g/m² (km)	1	3
Average shoreline length (km) at 100 g/m² (km)	1	1.5
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 17.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 1 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Colac Otway	10	1	-	4.83	9.38	-	21	101	1.1	3.3	4.8	1	-	8.6	1	-
Corangamite	1	-	-	5.46	-	-	38	38	0.9	0.9	1.9	-	-	1.9	-	-
Curtis Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
French Island	1	-	-	18.25	-	-	17	17	0.5	0.5	1	-	-	1	-	-
Glenelg	2	-	-	10.46	-	-	24	91	0.2	3.2	4.3	-	-	6.7	-	-
Greater Geelong	-	-	-	-	-	-	-	-	< 0.1	0.2	-	-	-	-	-	-
King Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Laurence Rocks	1	-	-	9.54	-	-	30	30	0.6	0.6	2.9	-	-	2.9	-	-
Mornington Peninsula	-	-	-	-	-	-	-	-	< 0.1	0.4	-	-	-	-	-	-
Moyne	2	-	-	16.83	-	-	16	34	0.2	2.9	7.2	-	-	13.4	-	-
Norman Island	1	-	-	16.42	-	-	43	43	0.9	0.9	1.9	-	-	1.9	-	-
Phillip Island	1	1	-	9.67	11.54	-	121	121	5.3	5.3	11.5	1	-	11.5	1	-
Shellback Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
South Gippsland	2	-	-	17.83	-	-	12	14	0.2	1.4	3.3	-	-	3.8	-	-
Surf Coast	1	-	-	27.96	-	-	11	11	1.5	1.5	1	-	-	1	-	-
Warrnambool	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-

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Table 17.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 1 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Colac Otway	4	-	-	9.04	-	-	17	72	0.3	3.9	5	-	-	4	-	-
Corangamite	2	-	-	5.38	-	-	23	57	0.2	3.8	7.6	-	-	2	-	-
Curtis Island	2	-	-	10.71	-	-	13	15	< 0.1	0.4	1.9	-	-	2	-	-
French Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Gleneelg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greater Geelong	1	-	-	12.79	-	-	13	13	0.6	0.6	1	-	-	1	-	-
King Island	5	-	-	5	-	-	22	96	0.5	8.2	8.4	-	-	5	-	-
Laurence Rocks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mornington Peninsula	2	-	-	14.63	-	-	17	50	0.1	2.9	4.8	-	-	2	-	-
Moyne	2	2	-	5.75	8.5	-	44	119	0.4	6.9	12.4	1	-	2	2	-
Norman Island	7	1	-	8.67	9.71	-	44	342	0.4	10	1.6	2.9	-	7	1	-
Phillip Island	1	-	-	25.54	-	-	11	11	0.9	0.9	1	-	-	1	-	-
Shellback Island	1	-	-	26.42	-	-	10	10	0.1	0.1	1	-	-	1	-	-
South Gippsland	11	1	-	8.88	25.21	-	20	100	0.8	6.5	5	1	-	11	1	-
Surf Coast	2	-	-	17.63	-	-	11	12	< 0.1	1	1.9	-	-	2	-	-
Warrnambool	1	-	-	5.92	-	-	74	74	2.1	2.1	4.8	-	-	1	-	-

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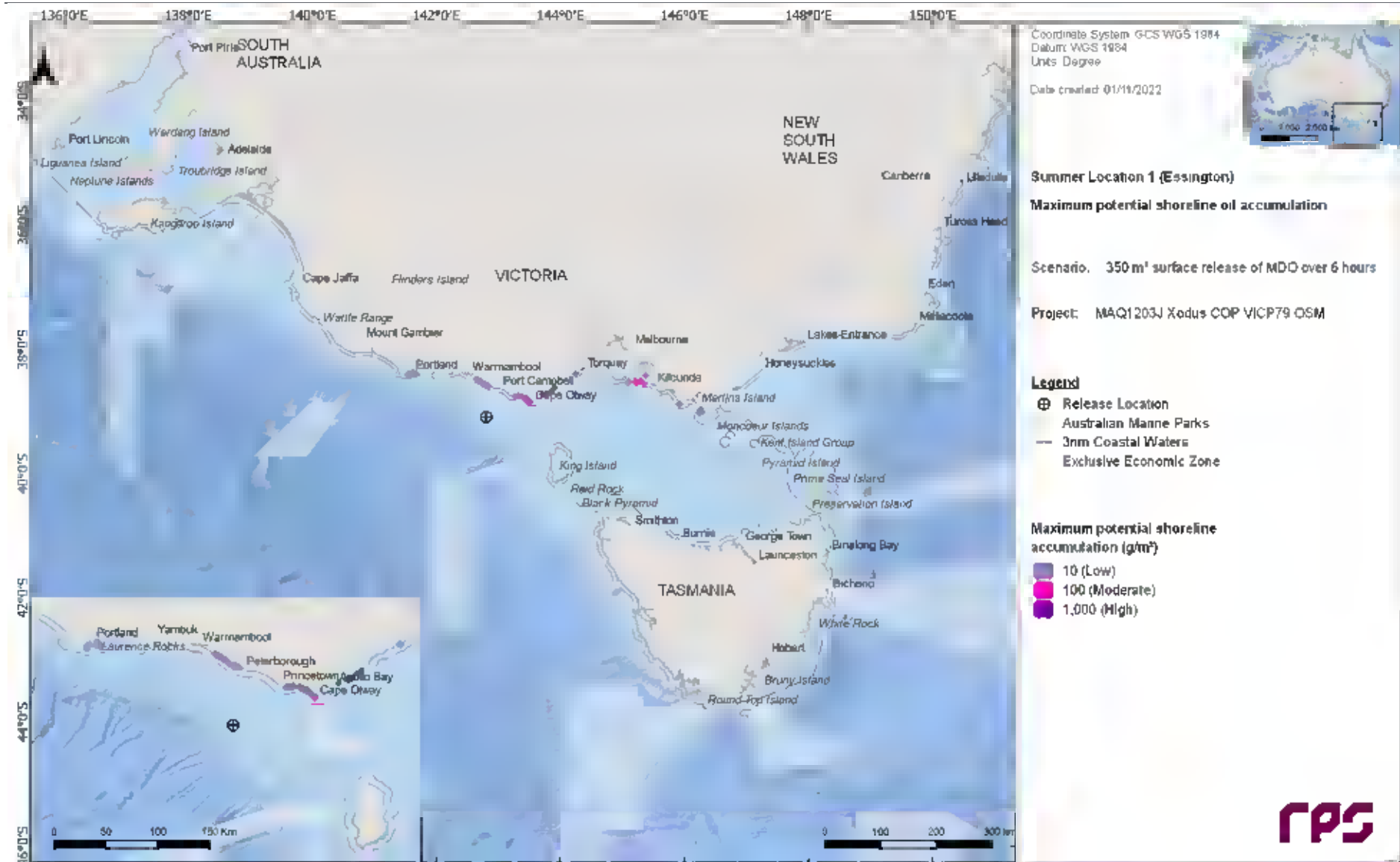


Figure 17.4 Maximum potential shoreline loading from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

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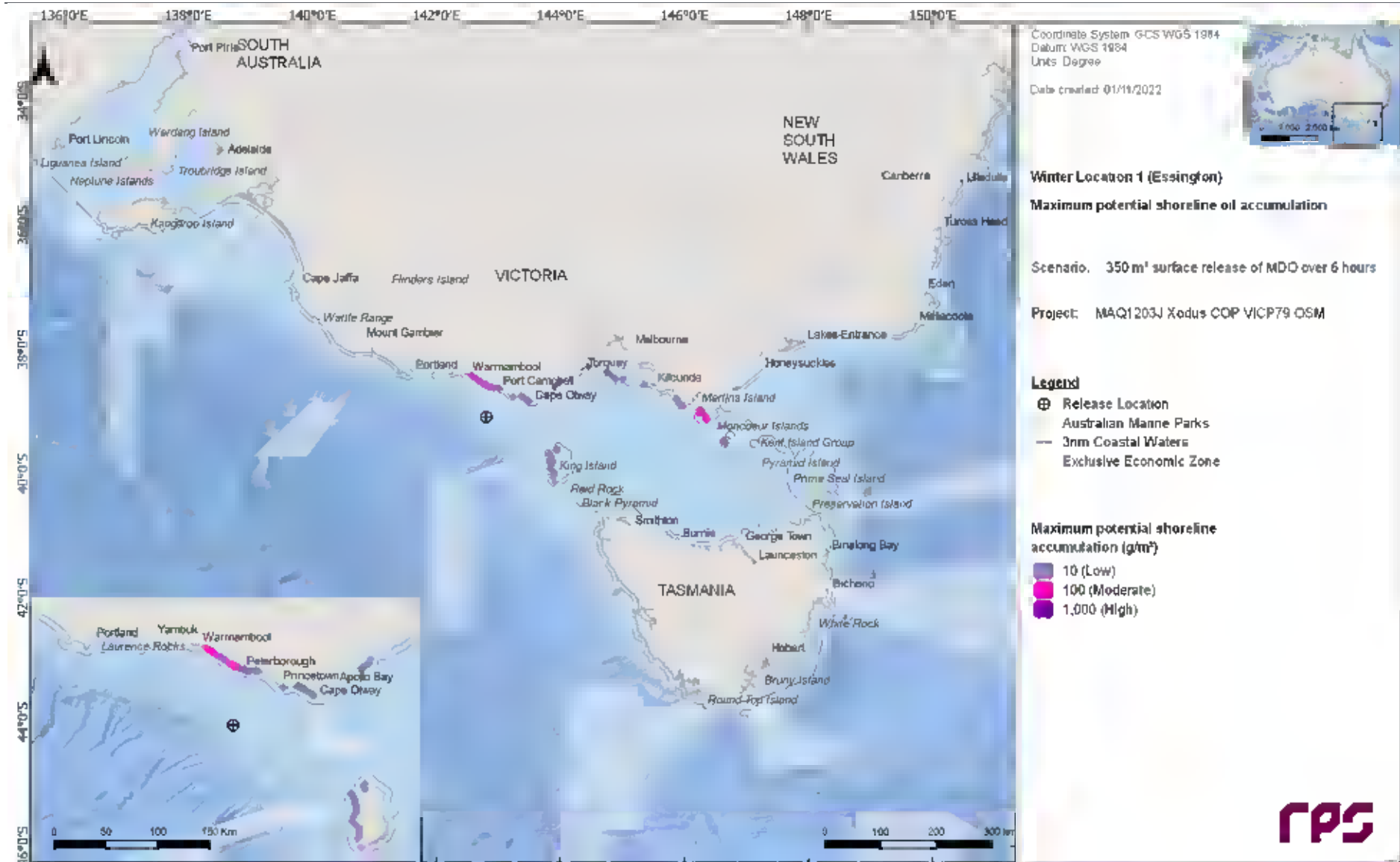


Figure 17.5 Maximum potential shoreline loading from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

17.2.3 In-water exposure

17.2.3.1 Dissolved Hydrocarbons

Table 17.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 17.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 17.6 and Figure 17.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 17.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	120	13	-
	Maximum distance (km) from release location (99 th percentile)	84	13	-
	Direction	E	SW	-
Winter	Maximum distance (km) from release location	125	11	-
	Maximum distance (km) from release location (99 th percentile)	99	11	-
	Direction	E	ESE	-

Table 17.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer					Winter		
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High rate
AMP	Apollo	18	1	-	-	18	2	-	-
	Central Bass Strait	16	1	-	-	19	1	-	-
IMCRA	Central Victoria	12	1	-	-	18	1	-	-
	Otway	113	50	7	-	94	52	7	-
KEF	West Tasmania Canyons	11	1	-	-	2	-	-	-

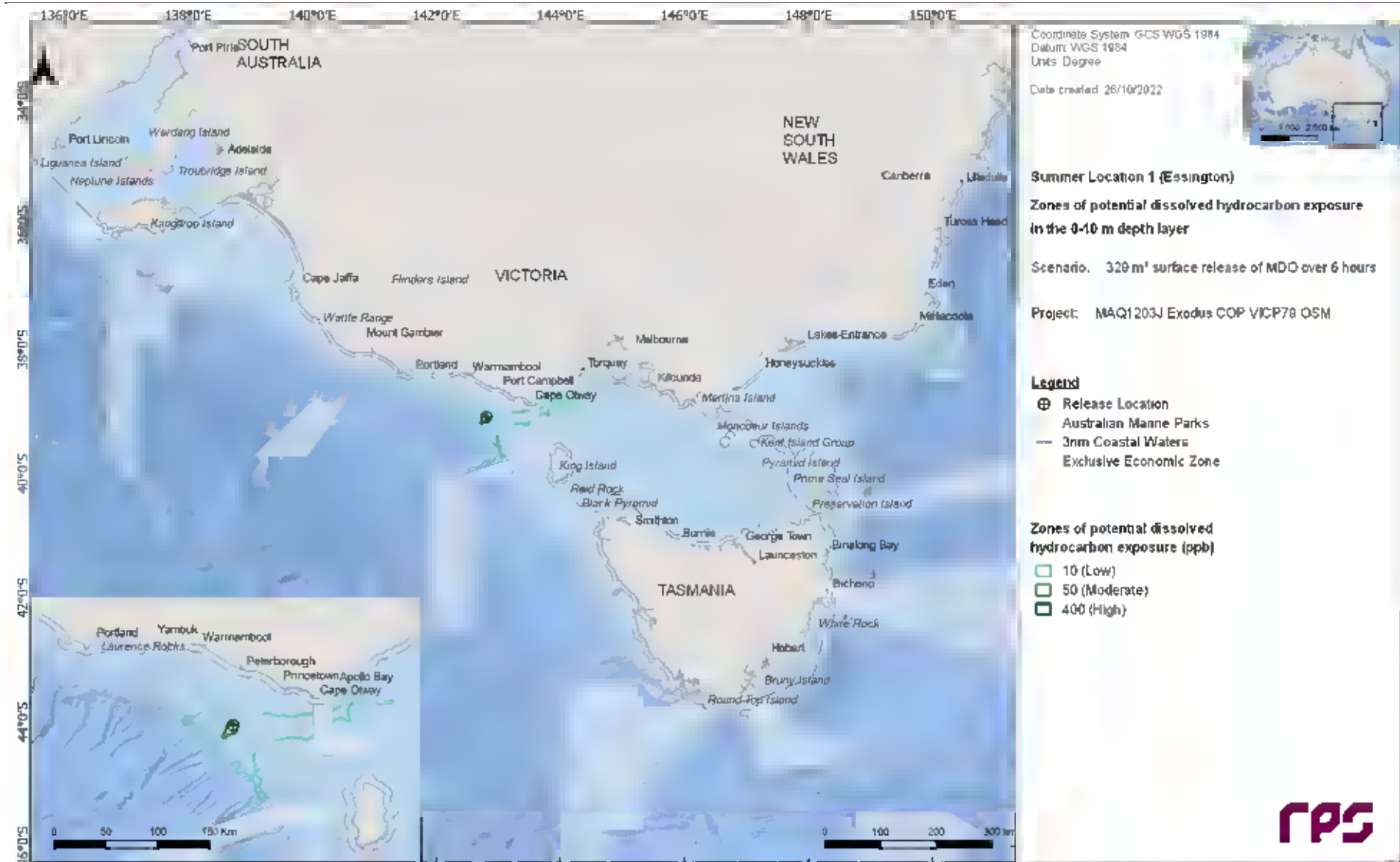


Figure 17.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

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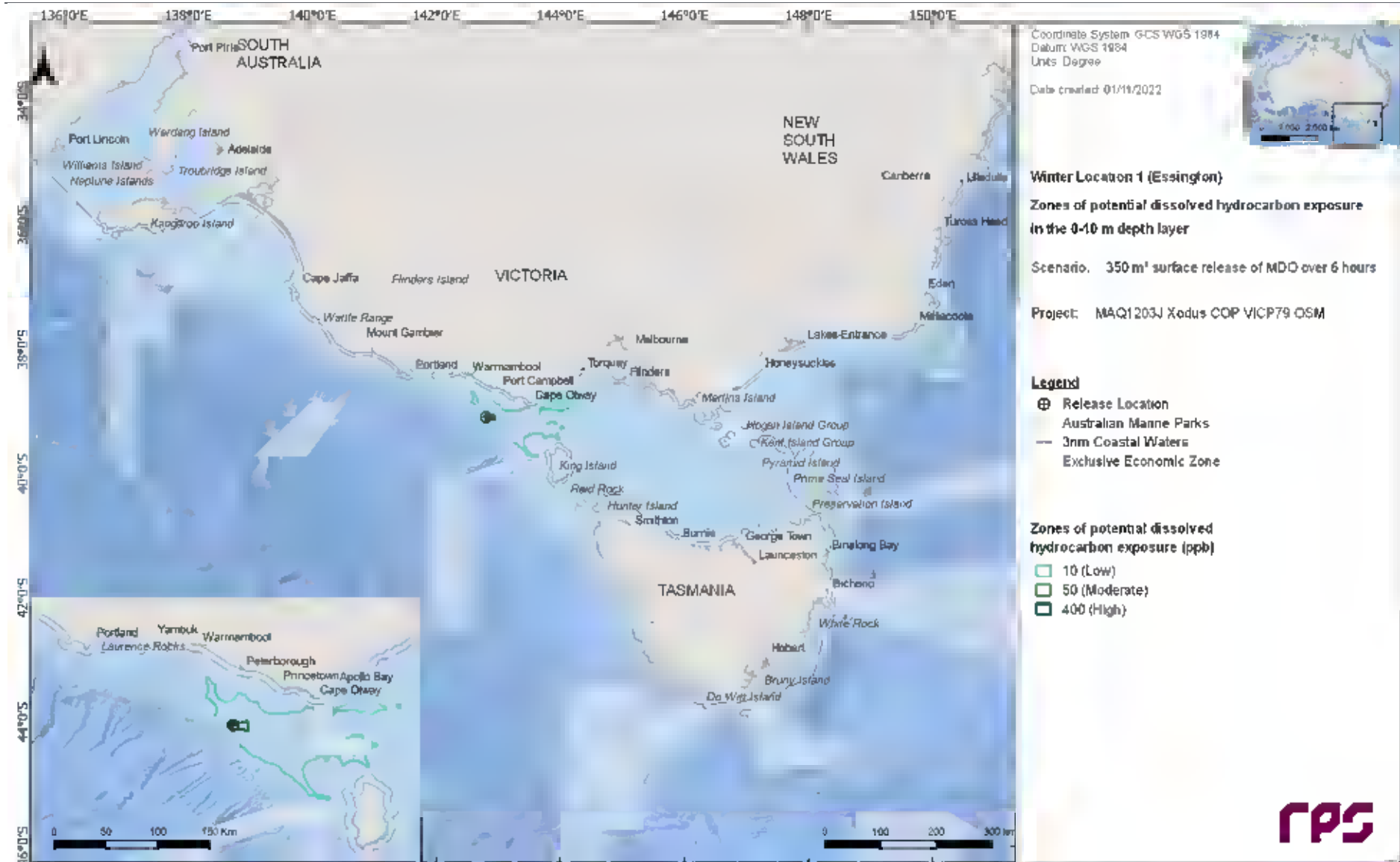


Figure 17.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

17.2.3.2 Entrained Hydrocarbons

Table 17.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 17.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 17.8 and Figure 17.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 17.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	681	149
	Maximum distance (km) from release location (99 th percentile)	344	126
	Direction	ENE	E
Winter	Maximum distance (km) from release location	700	158
	Maximum distance (km) from release location (99 th percentile)	678	140
	Direction	ENE	E

Table 17.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 1 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	412	28	8	348	39	11
	Beagle	17	2	-	33	9	-
	Franklin	12	4	-	8	-	-
	Zeehan	106	14	1	182	11	2
IBRA	Bridgewater	17	3	-	-	-	-
	Flinders	13	1	-	33	9	-
	Gippsland Plain	30	2	-	56	8	-
	Glenelg Plain	34	4	-	-	-	-
	King Island	27	3	-	71	8	-
	Otway Plain	184	14	1	93	7	-
	Otway Ranges	89	10	-	91	6	-
	Strzelecki Ranges	19	2	-	29	8	-
	Tasmanian West	1	-	-	11	1	-
	Warrnambool Plain	40	3	-	119	5	1
	Wilson's Promontory	29	2	-	76	9	-
	IMCRA	Batemans Shelf	-	-	-	15	1
Central Bass Strait		327	26	6	313	39	6
Central Victoria		300	25	6	246	32	5
Flinders		30	2	-	76	12	-
Franklin		10	-	-	23	3	-
Otway		9,295	97	90	9,662	100	94
Twofold Shelf		14	1	-	25	8	-
Victorian Embayments		26	1	-	23	1	-
KEF	Bonney Coast Upwelling	52	5	-	91	1	-
	Upwelling East of Eden	11	1	-	18	3	-
	West Tasmania Canyons	480	28	11	106	8	1
	Bonney Coast Upwelling	52	5	-	91	1	-
MNP	Bunurong	7	-	-	20	4	-
	Cape Howe	4	-	-	11	1	-
	Churchill Island	11	1	-	6	-	-
	Discovery Bay	13	1	-	-	-	-
	Point Addis	22	2	-	18	1	-
	Port Phillip Heads	14	1	-	15	1	-
	Twelve Apostles	32	2	-	92	4	-
	Wilson's Promontory	19	1	-	53	8	-
MS	Marengo Reefs	40	6	-	10	1	-
	Merri	12	1	-	1	-	-
	Mushroom Reef	18	1	-	9	-	-

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	The Arches	23	1	-	27	2	-
	Anser Island	5	-	-	33	7	-
	Bass Coast	9	-	-	18	3	-
	Black Pyramid	11	2	-	8	-	-
	Colac Otway	184	14	1	93	7	-
	Corangamite	52	4	-	119	5	1
	Curtis Island	11	1	-	33	9	-
	Glenelg	34	4	-	-	-	-
	Glennie Group	18	1	-	50	7	-
	Greater Geelong	19	2	-	16	1	-
	Hogan Island Group	13	1	-	21	8	-
	Kanowna Island	4	-	-	30	9	-
	Kent Island Group	-	-	-	19	1	-
	King Island	27	3	-	80	8	-
	Lady Julia Percy Island	17	3	-	-	-	-
Nearshore Waters	Laurence Rocks	31	4	-	-	-	-
	Moncoeur Islands	13	1	-	33	7	-
	Mornington Peninsula	21	1	-	27	2	-
	Moyne	36	3	-	112	4	1
	Mud Island	1	-	-	10	1	-
	Norman Island	29	1	-	76	6	-
	Phillip Island	30	1	-	13	1	-
	Reid Rock	15	1	-	18	2	-
	Rodondo Island	11	1	-	29	7	-
	Shellback Island	26	2	-	52	5	-
	Skull Rock	4	-	-	28	7	-
	South Gippsland	30	2	-	70	8	-
	Surf Coast	26	3	-	18	4	-
	Warrnambool	20	2	-	56	1	-
	West Coast	1	-	-	11	1	-
NP	Kent Group	-	-	-	17	3	-
	Bunurong Marine Park	7	-	-	16	2	-
NPS4	Wilson's Promontory Marine Park	26	2	-	59	6	-
	Wilson's Promontory Marine Reserve	17	1	-	47	6	-
Ramsar	Port Phillip Bay (Western Shoreline) and Bellarine Peninsula	14	1	-	8	-	-
	Western Port	11	1	-	6	-	-
	Bell Reef	15	2	-	15	2	-
RSB	Bravenes Rock	121	9	1	80	7	-
	Cody Bank	19	3	-	23	4	-
	Cutter Rock	14	1	-	30	9	-
	New Zealand Star Bank	7	-	-	17	1	-
State Waters	New South Wales	4	-	-	11	1	-
	Tasmania	49	4	-	124	16	1
	Victoria	203	18	2	142	14	1

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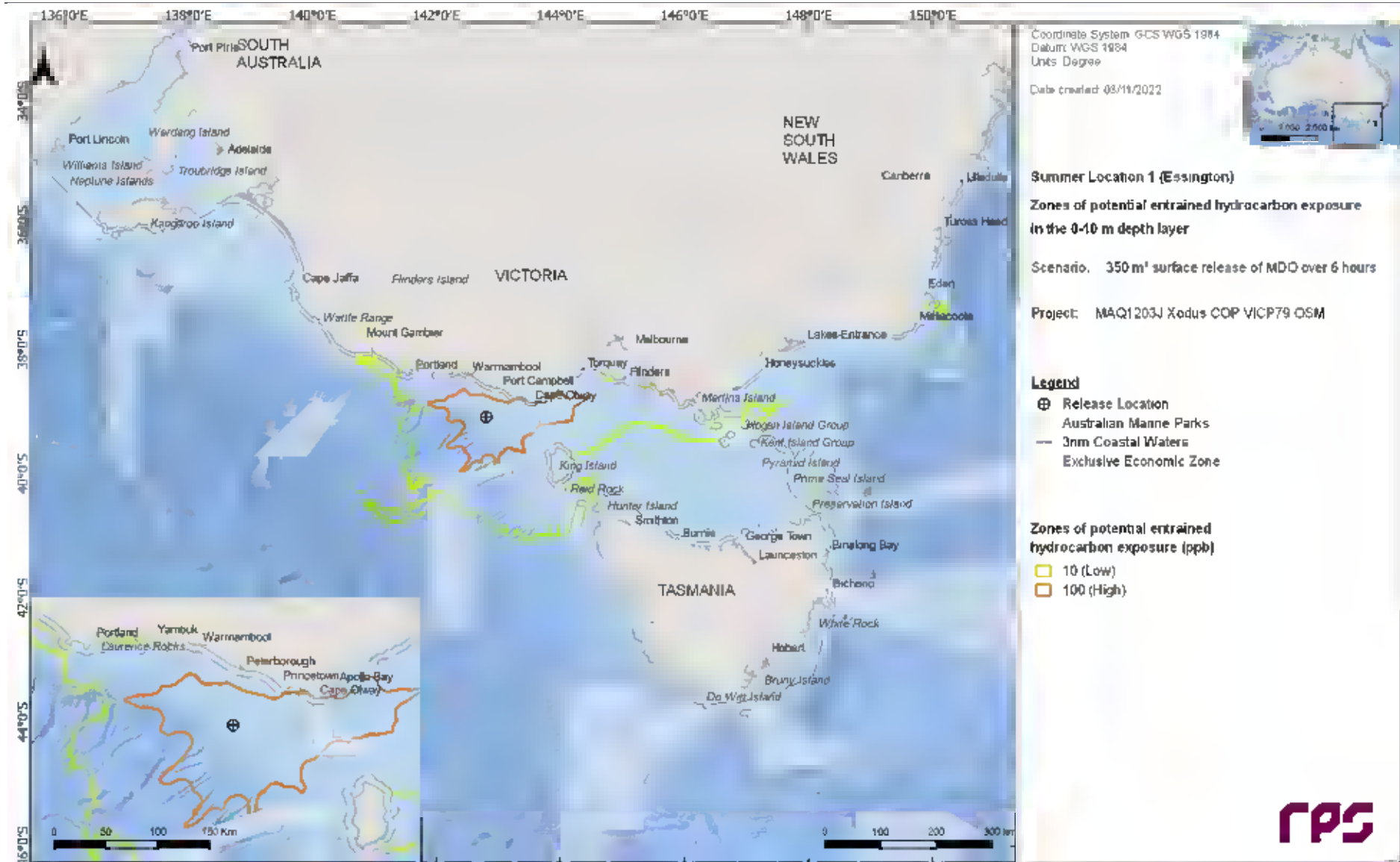


Figure 17.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during summer conditions. The results were calculated from 100 spill simulations.

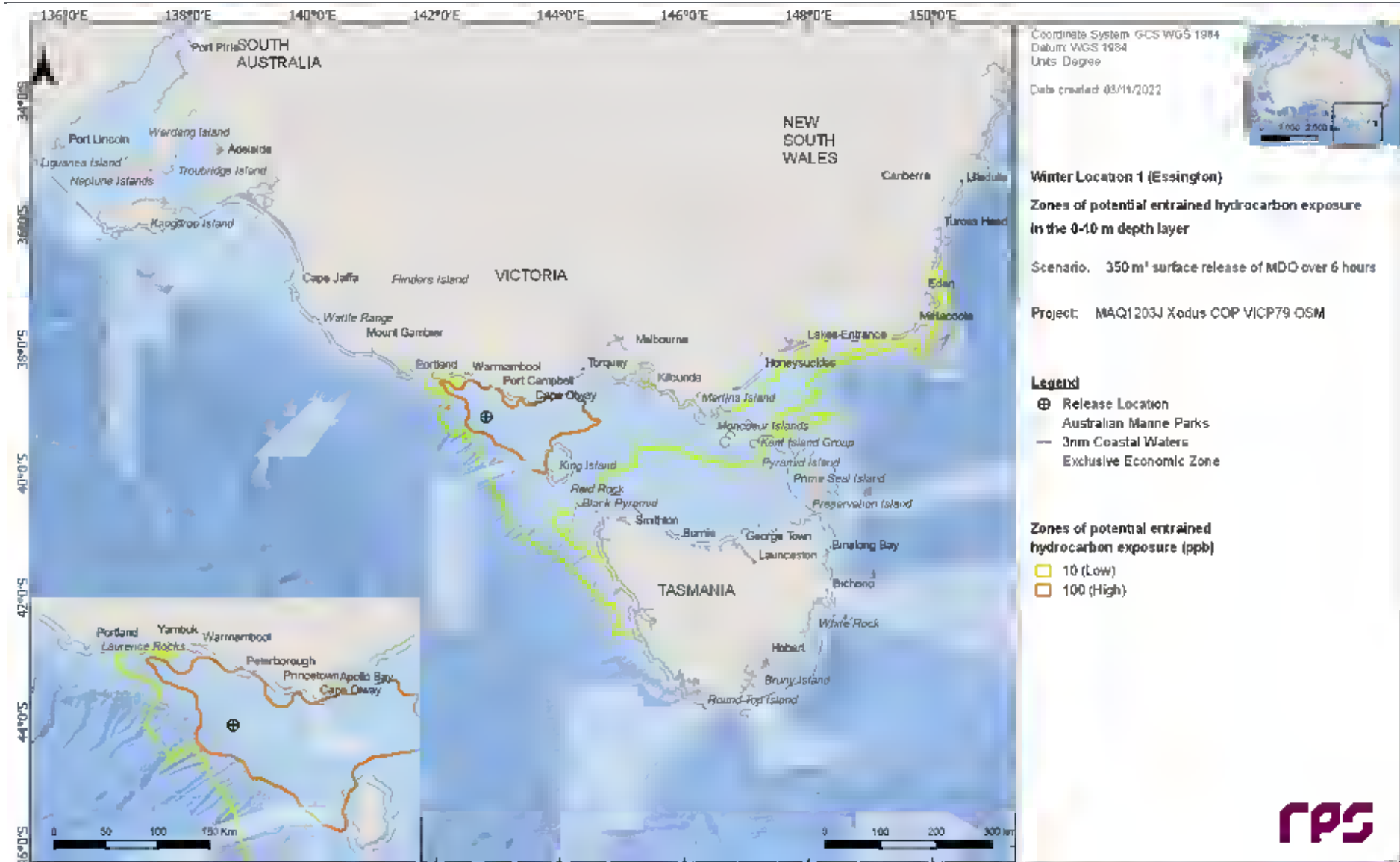


Figure 17.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 1 during winter conditions. The results were calculated from 100 spill simulations.

17.3 Deterministic Analysis

17.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 1 pm 8th July 2019.

Figure 17.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 8.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 17.11 and Figure 17.12, respectively.

Figure 17.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 164 m³ (~47%) was lost to the atmosphere through evaporation. Approximately, 115 m³ (~33%) of the released volume decayed, while approximately 60 m³ (~17%) was predicted to remain within the water column and approximately 14 m³ (~4%) was present on the shorelines.

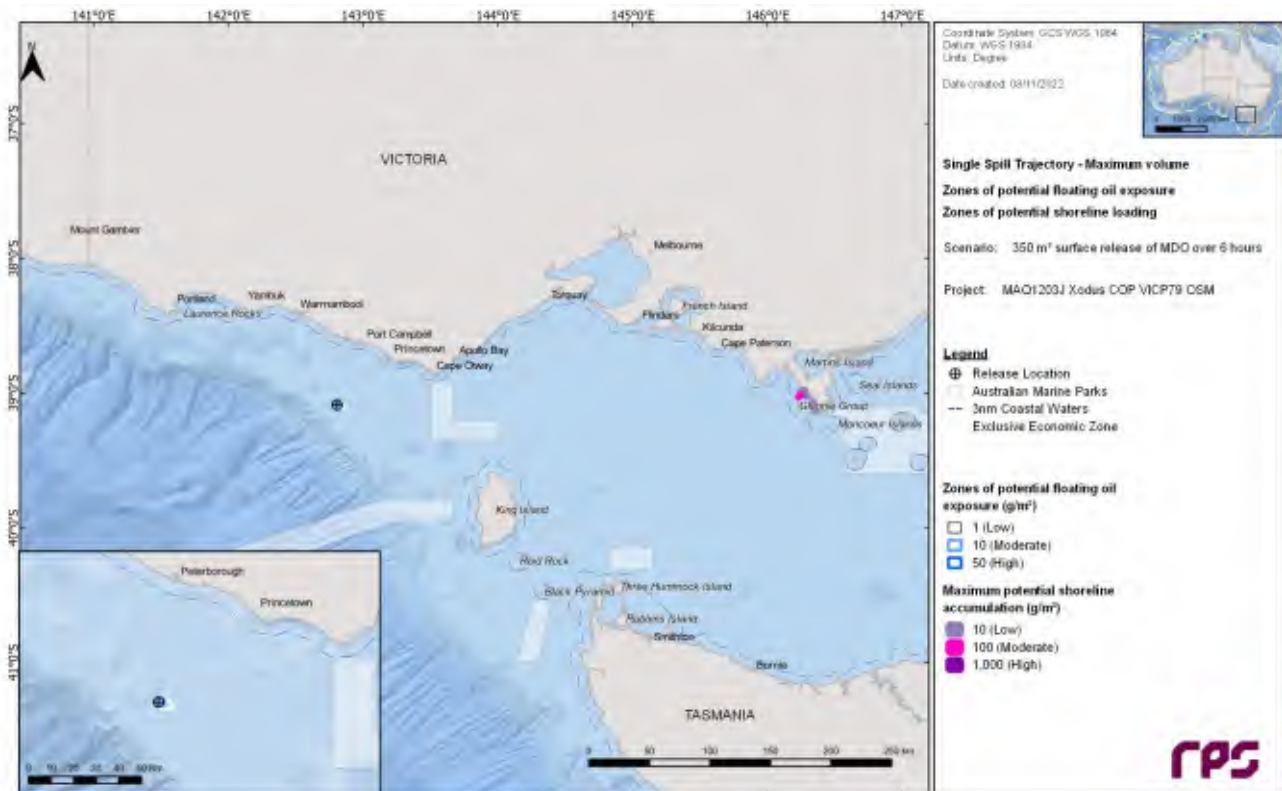


Figure 17.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

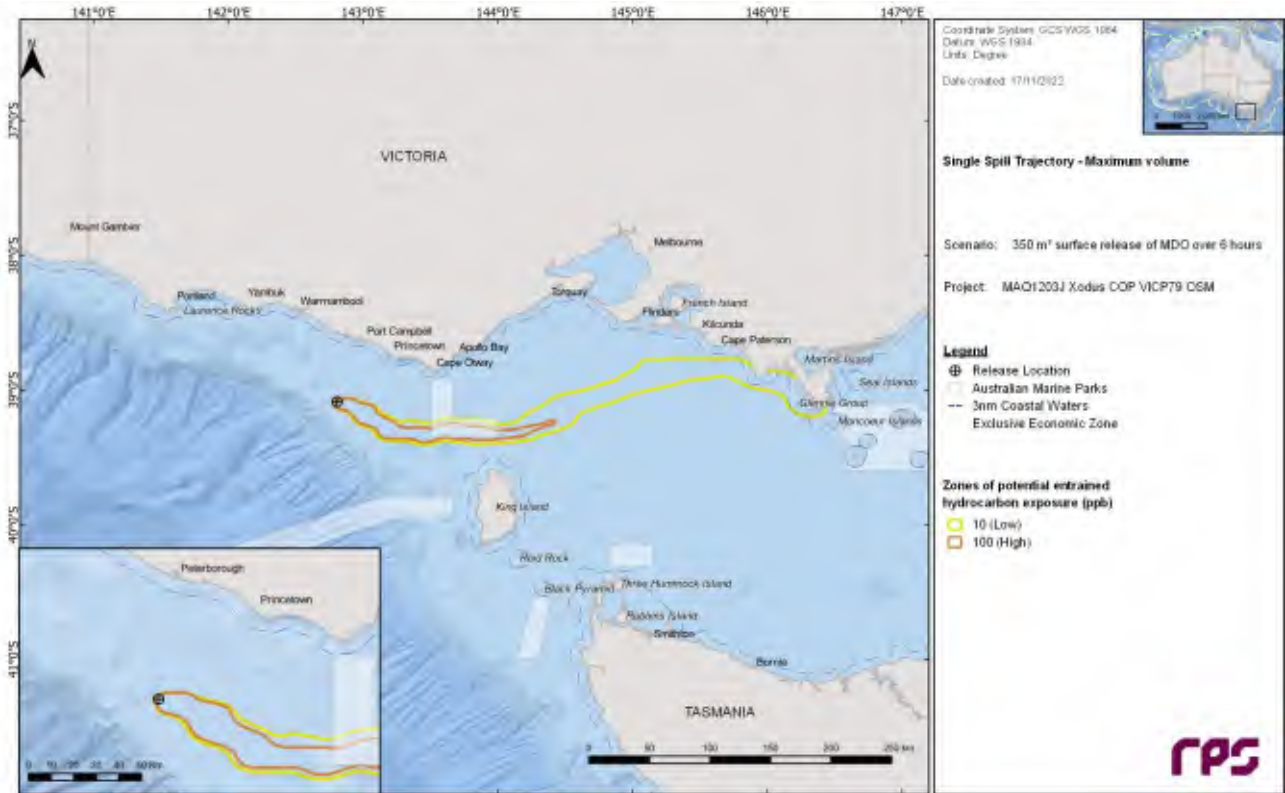


Figure 17.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

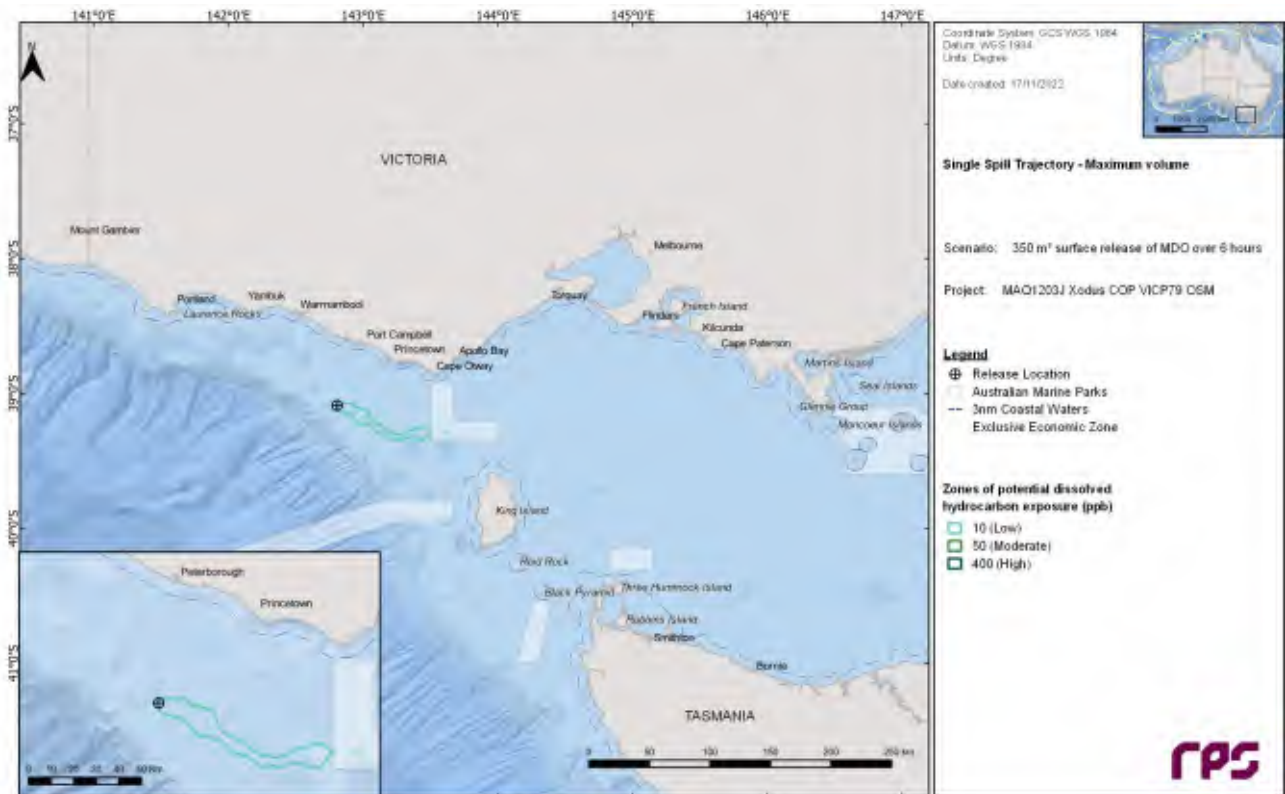


Figure 17.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

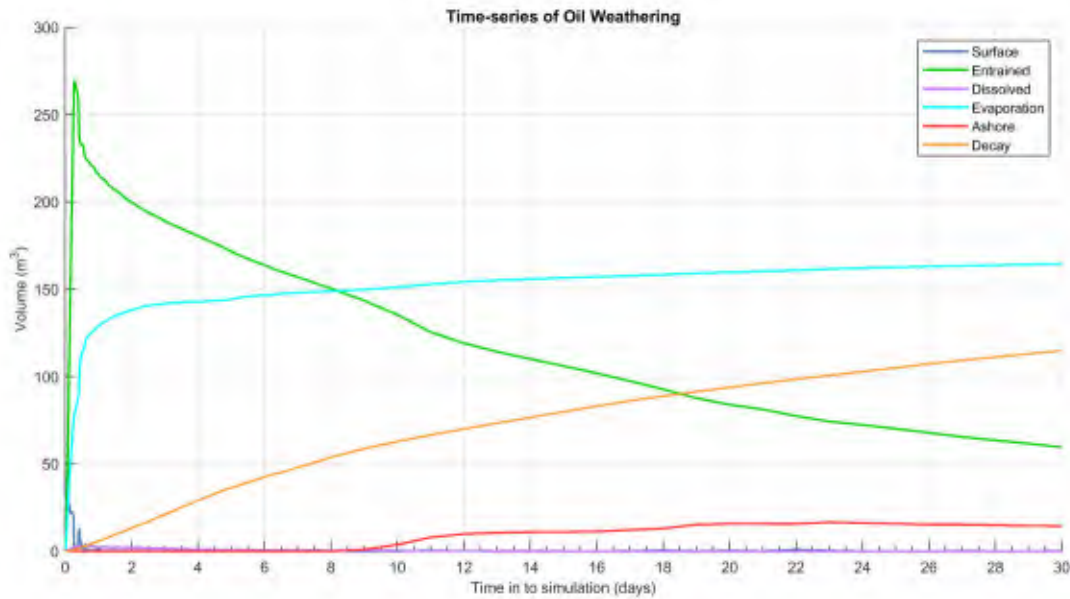


Figure 17.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 1.

17.3.2 Largest Area of Floating Hydrocarbon Exposure

The simulation that resulted in the largest swept area of floating hydrocarbon exposure at or above the low exposure threshold of 201.6 km² was identified as run number 38 and commenced during winter conditions, 6 pm 5th August 2011.

Figure 17.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). No shoreline accumulation was predicted during the simulation.

The extent of the predicted entrained hydrocarbon exposure zones in the 0–10 m depth layer over the entire simulation period of 30 days is presented in Figure 17.15. No zones of dissolved hydrocarbon exposure was predicted for the simulation.

Figure 17.16 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 176 m³ (~50%) was lost to the atmosphere through evaporation. Approximately, 100 m³ (~28%) of the released volume decayed, while approximately 77 m³ (~22%) was predicted to remain within the water column.

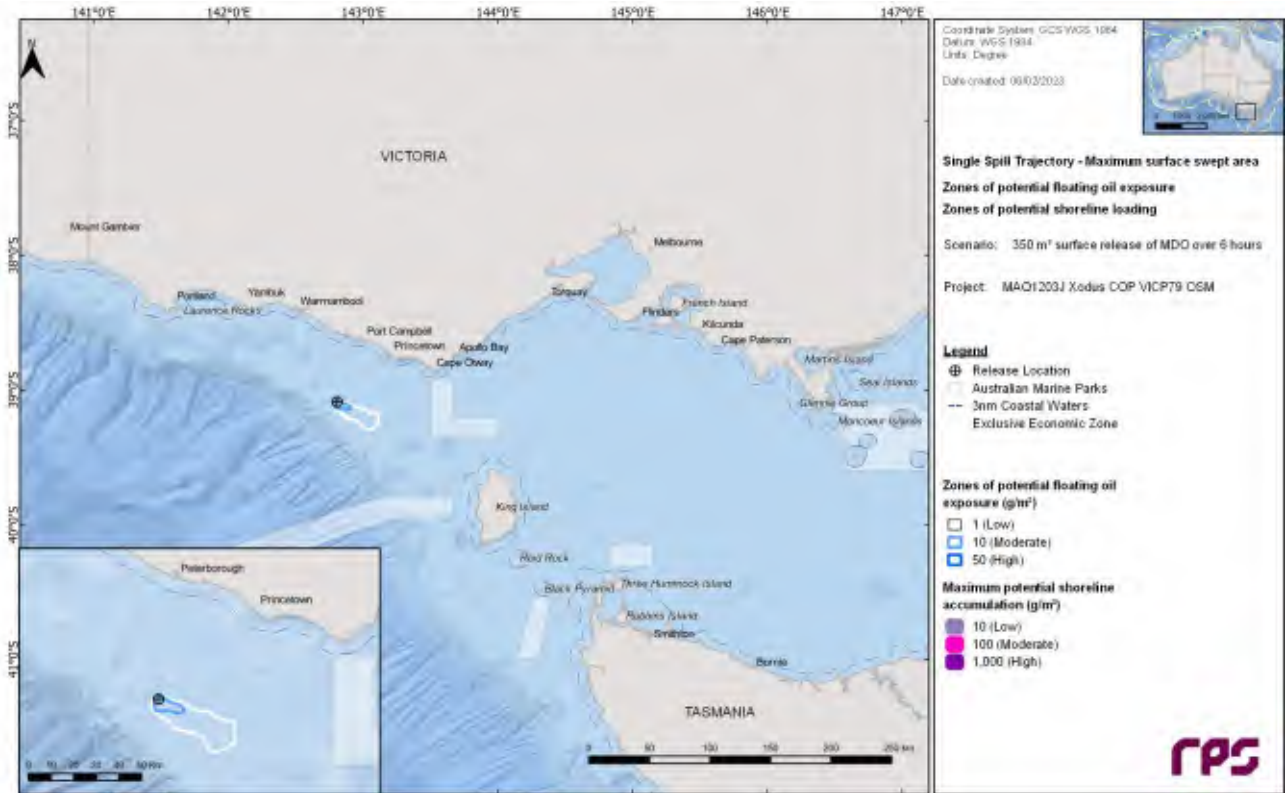


Figure 17.14 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest area of floating hydrocarbon exposure from a vessel collision at Location 1.

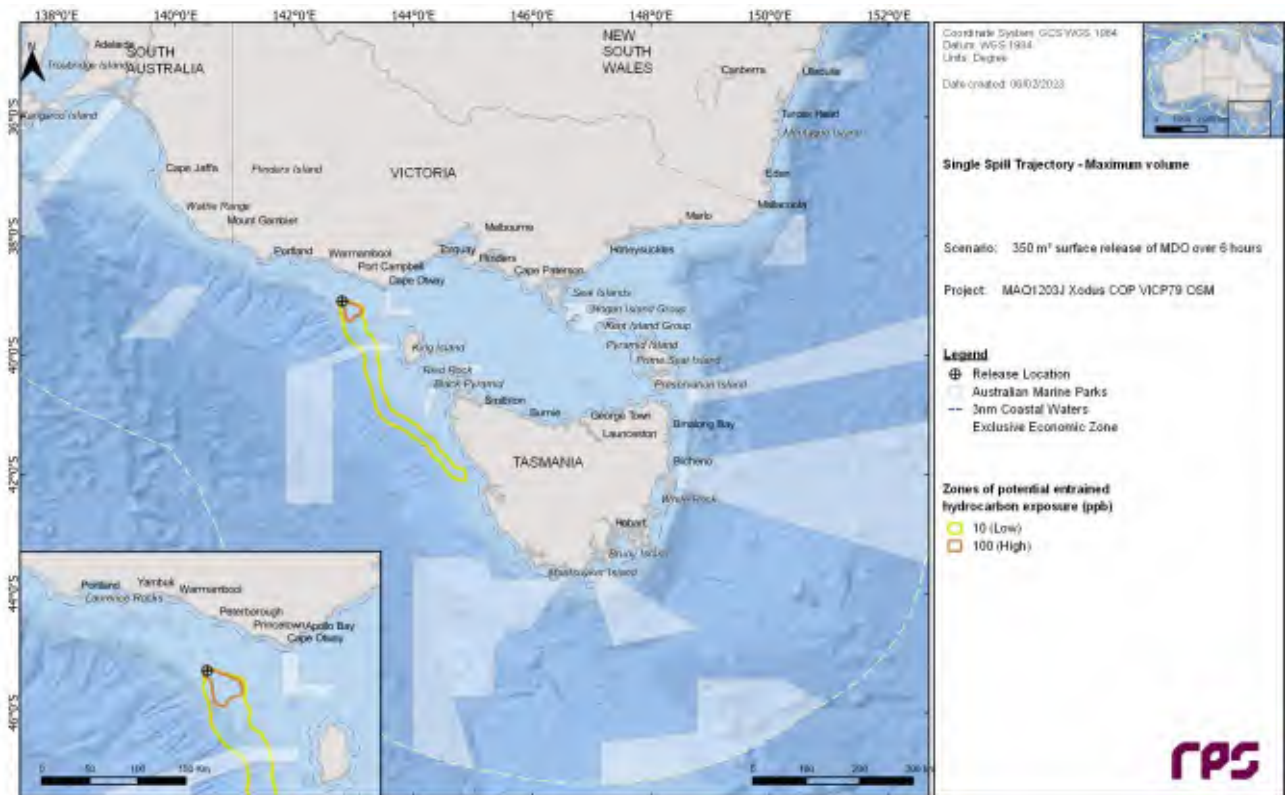


Figure 17.15 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest area of floating hydrocarbon exposure from a vessel collision at Location 1.

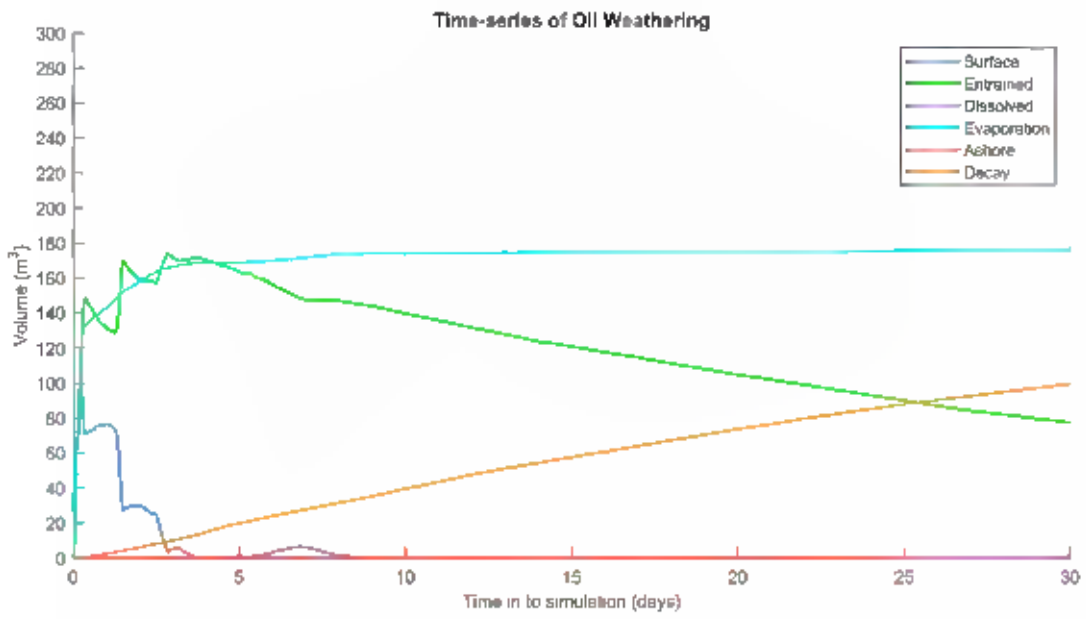


Figure 17.16 Predicted weathering and fates for the simulation that led to the largest area of floating hydrocarbons exposure from a vessel collision at Location 1.

18 LOCATION 2 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 2. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 18.1 presents the EMBA, Section 18.2 shows the seasonal (or stochastic) results, while Section 18.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

18.1 EMBA

Figure 18.1 shows the EMBA for Location 2. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

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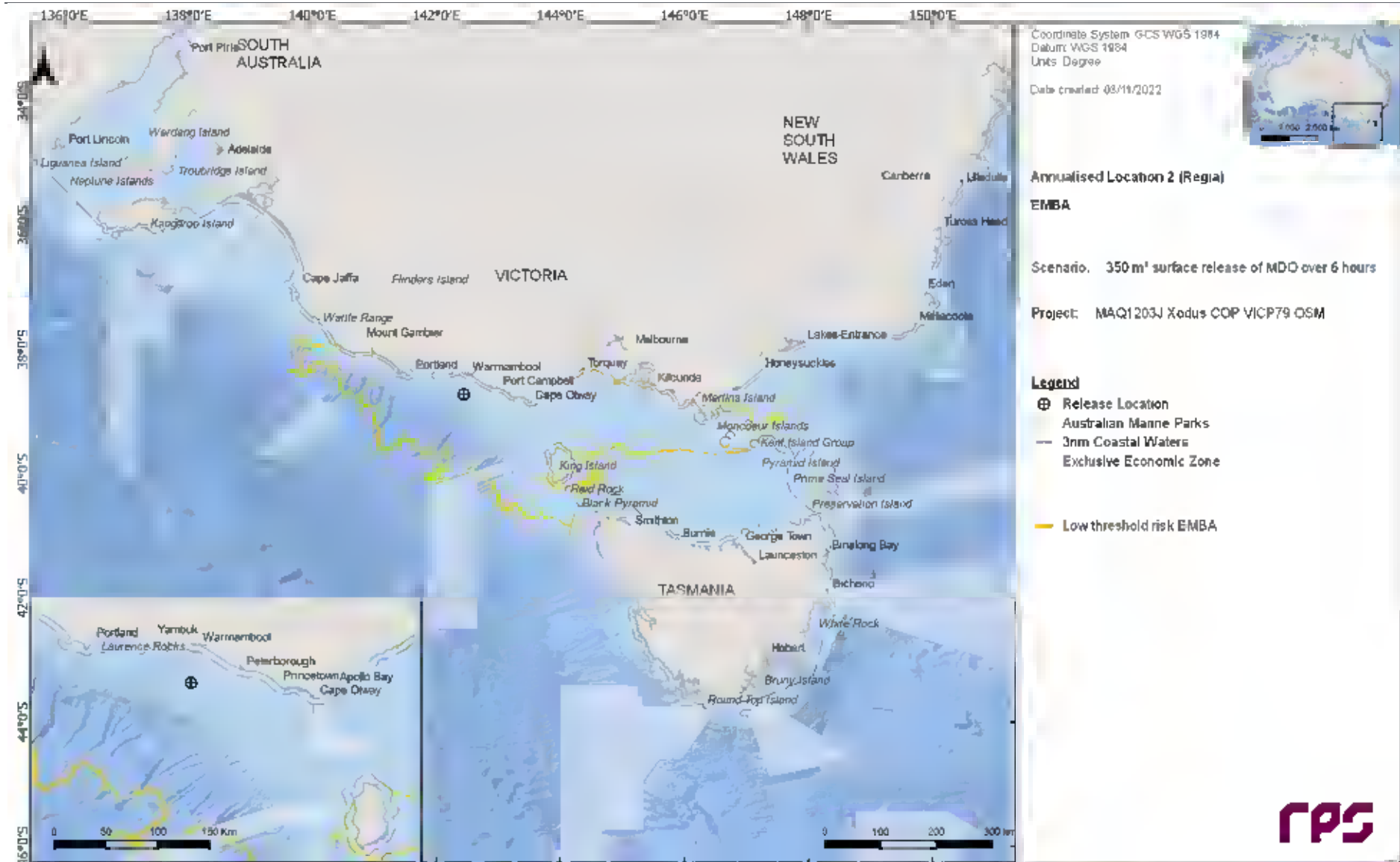


Figure 18.1 Predicted low threshold EMBA from a vessel collision at Location 2. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

18.2 Stochastic Analysis

18.2.1 Floating Oil Exposure

Table 18.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 18.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 18.2 to Figure 18.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 188.8 km² and 154.1 km², respectively.

Table 18.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	23.2	21.2	5.5
	Maximum distance (km) from release location (99 th percentile)	22.6	20.8	5.5
	Direction	ENE	WSW	NE
Winter	Maximum distance (km) from release location	59.9	20.1	3.4
	Maximum distance (km) from release location (99 th percentile)	28.2	18.9	3.4
	Direction	E	ESE	SW

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Table 18.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 2 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
IBRA	Warrnambool Plain	1	-	-	-	2.92	-	-	-	3	1	-	-
IMCRA	Otway	100	100	100	26	0.04	0.04	0.04	0.04	100	100	100	23
MNP	Twelve Apostles	-	-	-	-	-	-	-	-	3	2	-	-
State Waters	Victoria	2	-	-	-	1.96	-	-	-	5	2	-	-

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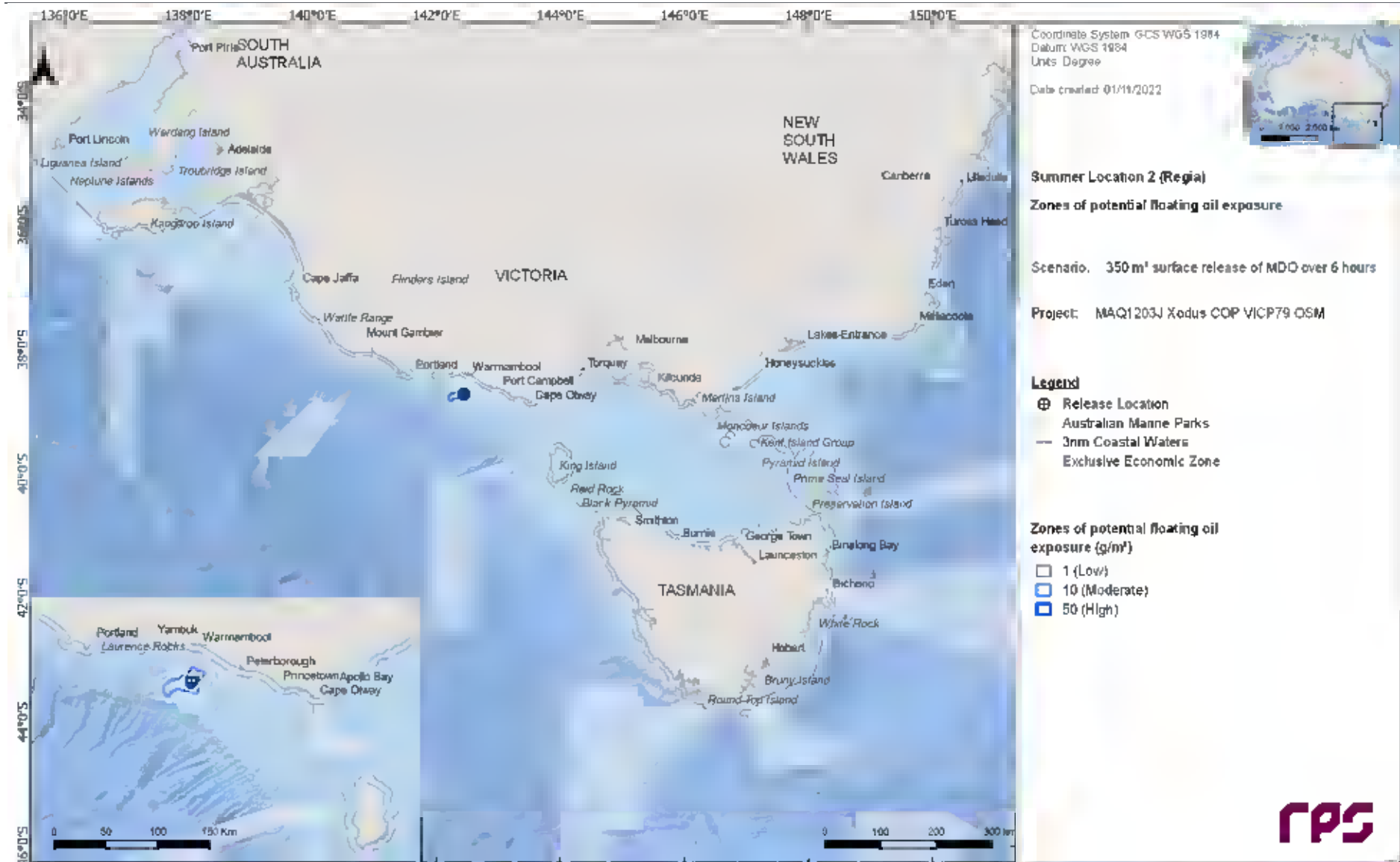


Figure 18.2 Zones of potential floating oil exposure from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

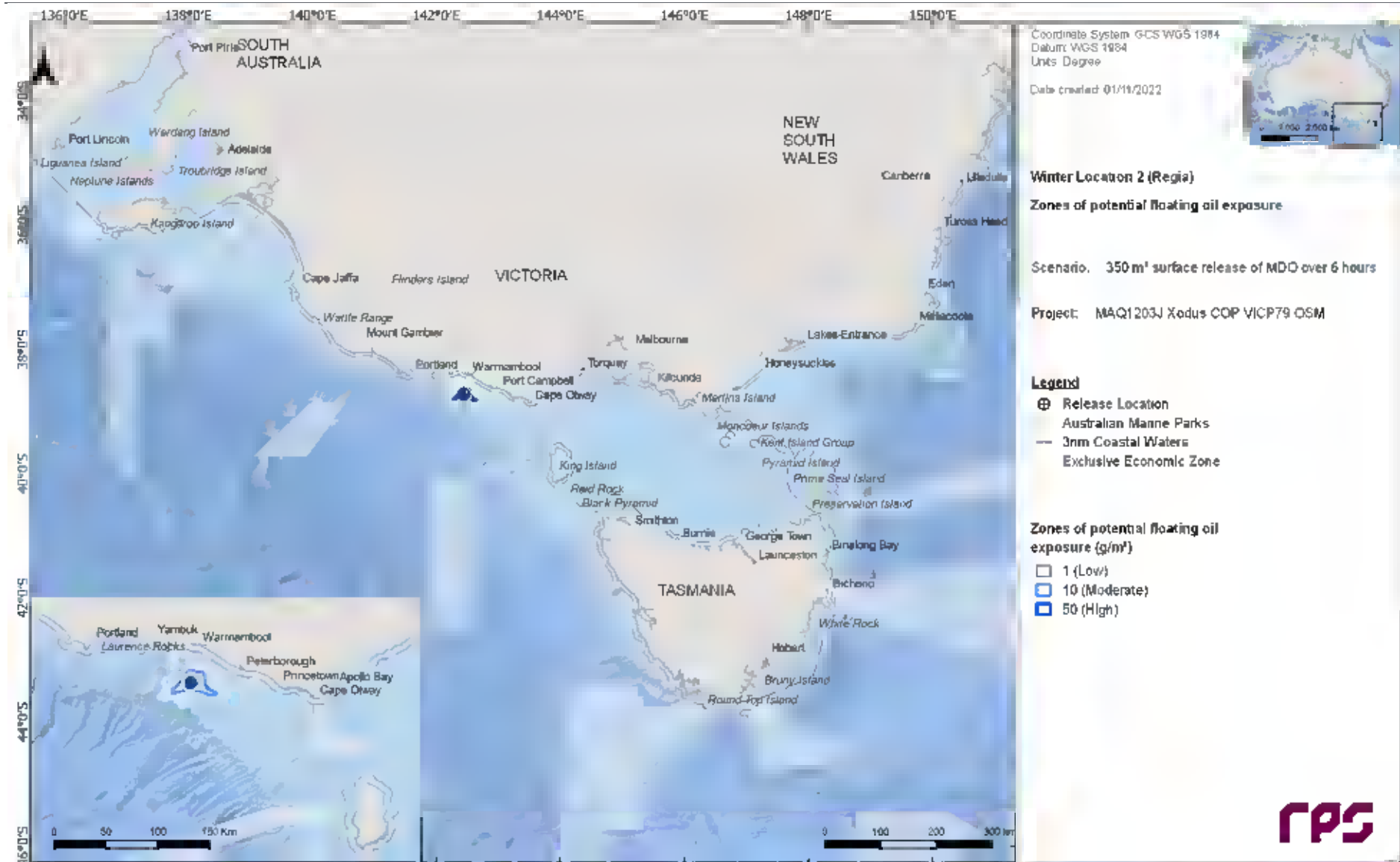


Figure 18.3 Zones of potential floating oil exposure from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

18.2.2 Shoreline Accumulation

Table 18.3 Table 17.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 18.4 to Table 18.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 18.4 and Figure 18.5.

Table 18.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 2 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	45	41
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	2.88	1.83
Maximum volume of hydrocarbons ashore (m ³)	20.3	28.9
Average volume of hydrocarbons ashore (m ³)	4.4	5.4
Maximum length of the shoreline at 10 g/m² (km)	22	32
Average shoreline length (km) at 10 g/m² (km)	9	10.3
Maximum length of the shoreline at 100 g/m² (km)	5	5
Average shoreline length (km) at 100 g/m² (km)	2.7	3
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 18.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 2 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Bass Coast	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colac Otway	14	2	-	6	9.63	-	24	177	1	10.4	7.9	1.4	-	21	1.9	-
Corangamite	20	4	-	2.88	3.92	-	42	464	1.9	19.2	6.5	3.6	-	15.3	4.8	-
East Gippsland	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Gleneleg	3	-	-	7.17	-	-	17	22	< 0.1	1.9	1.3	-	-	1.9	-	-
Glennie Group	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Greater Geelong	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kanowna Island	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
King Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lady Julia Percy Island	3	-	-	6.17	-	-	20	28	< 0.1	0.3	1	-	-	1	-	-
Moncoeur Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moyne	19	4	-	2.96	4.13	-	35	233	1.5	11.5	6.1	2.2	-	16.3	3.8	-
Norman Island	-	-	-	-	-	-	-	-	< 0.1	0.2	-	-	-	-	-	-
Phillip Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Rodondo Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shellback Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Skull Rock	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
South Gippsland	2	-	-	25.54	-	-	15	20	< 0.1	1.2	3.8	-	-	3.8	-	-
Warrnambool	5	-	-	7.33	-	-	16	30	0.1	1.5	4	-	-	5.7	-	-

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Table 18.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 2 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	1	-	-	12.38	-	-	54	54	0.6	0.6	1	-	-	1	-	1
Bass Coast	1	-	-	27.13	-	-	12	12	0.3	0.3	1	-	-	1	-	1
Colac Otway	25	3	-	3.04	4.21	-	32	563	1.7	10.6	6	1.9	-	12.4	2.9	25
Corangamite	18	7	-	2.38	3.54	-	44	318	2.4	14.1	8.7	2.7	-	20.1	3.8	18
East Gippsland	1	-	-	27.79	-	-	14	14	0.3	0.3	1	-	-	1	-	1
Glenelg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glennie Group	3	1	-	9.08	11.46	-	38	190	0.2	6.9	4.1	1.9	-	6.7	1.9	3
Greater Geelong	1	-	-	21.67	-	-	15	15	1.0	1.0	1	-	-	1	-	1
Kanowna Island	2	-	-	12.67	-	-	17	18	< 0.1	0.5	1.4	-	-	1.9	-	2
King Island	1	-	-	17.04	-	-	18	18	1.0	1.0	1	-	-	1	-	1
Lady Julia Percy Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moncoeur Islands	2	-	-	13.17	-	-	13	13	< 0.1	0.3	1	-	-	1	-	2
Moynes	4	-	-	2.83	-	-	25	44	0.2	2.8	6.2	-	-	9.6	-	4
Norman Island	3	1	-	9.46	11.33	-	49	152	0.2	4.5	3.2	1.9	-	3.8	1.9	3
Phillip Island	1	-	-	13.92	-	-	17	22	0.6	0.6	2.9	-	-	2.9	-	1
Rodondo Island	3	-	-	11.5	-	-	25	38	< 0.1	0.4	1	-	-	1	-	3
Shellback Island	2	-	-	10.83	-	-	25	37	< 0.1	0.4	1	-	-	1	-	2
Skull Rock	2	-	-	12.67	-	-	17	18	< 0.1	0.4	1.4	-	-	1.9	-	2
South Gippsland	3	1	-	9.54	11.54	-	31	116	0.2	3.1	4.5	1	-	5.7	1	3
Warrnambool	2	1	-	1.83	2.46	-	66	612	0.7	28	11.5	4.8	-	19.1	4.8	2

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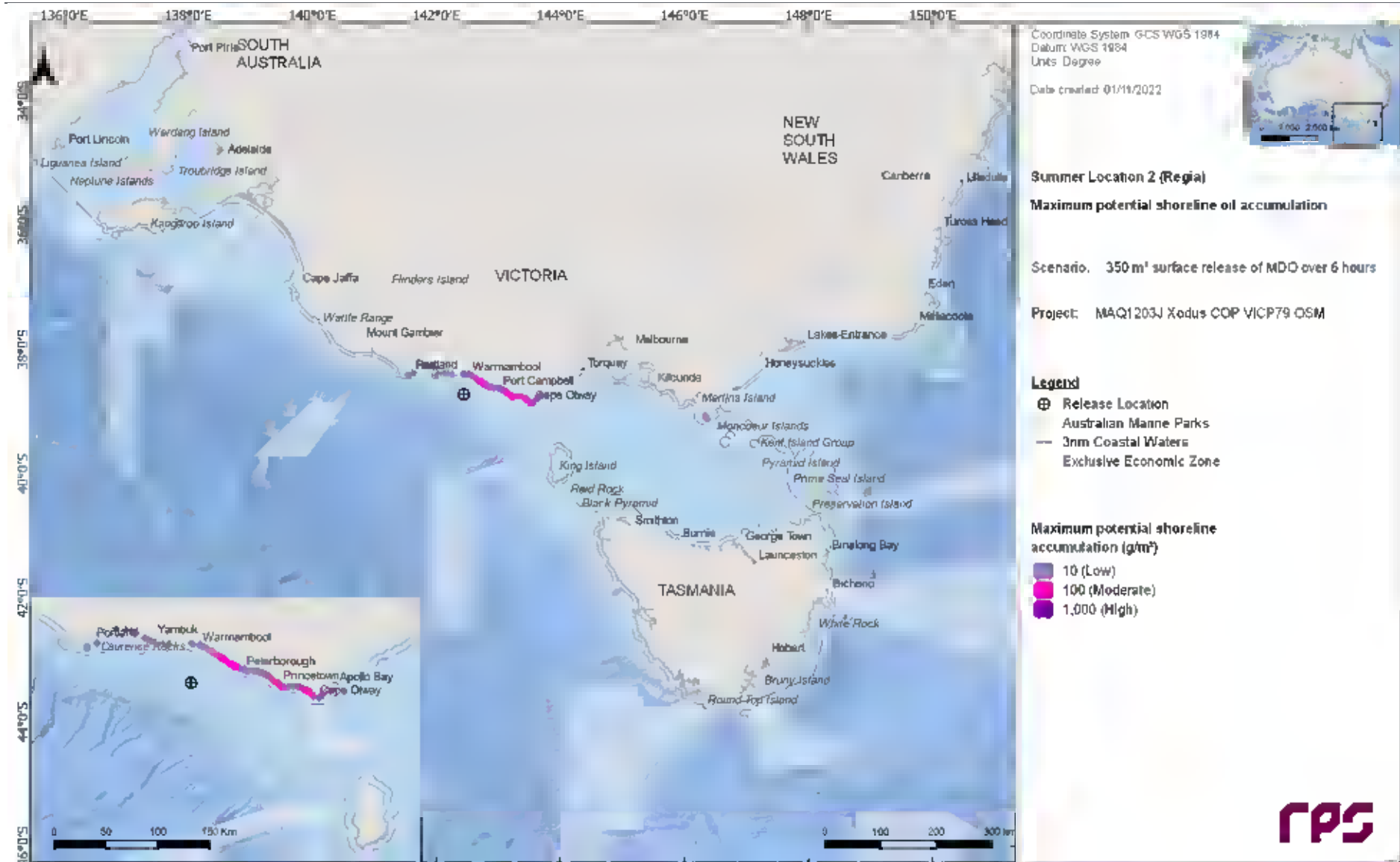


Figure 18.4 Maximum potential shoreline loading from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

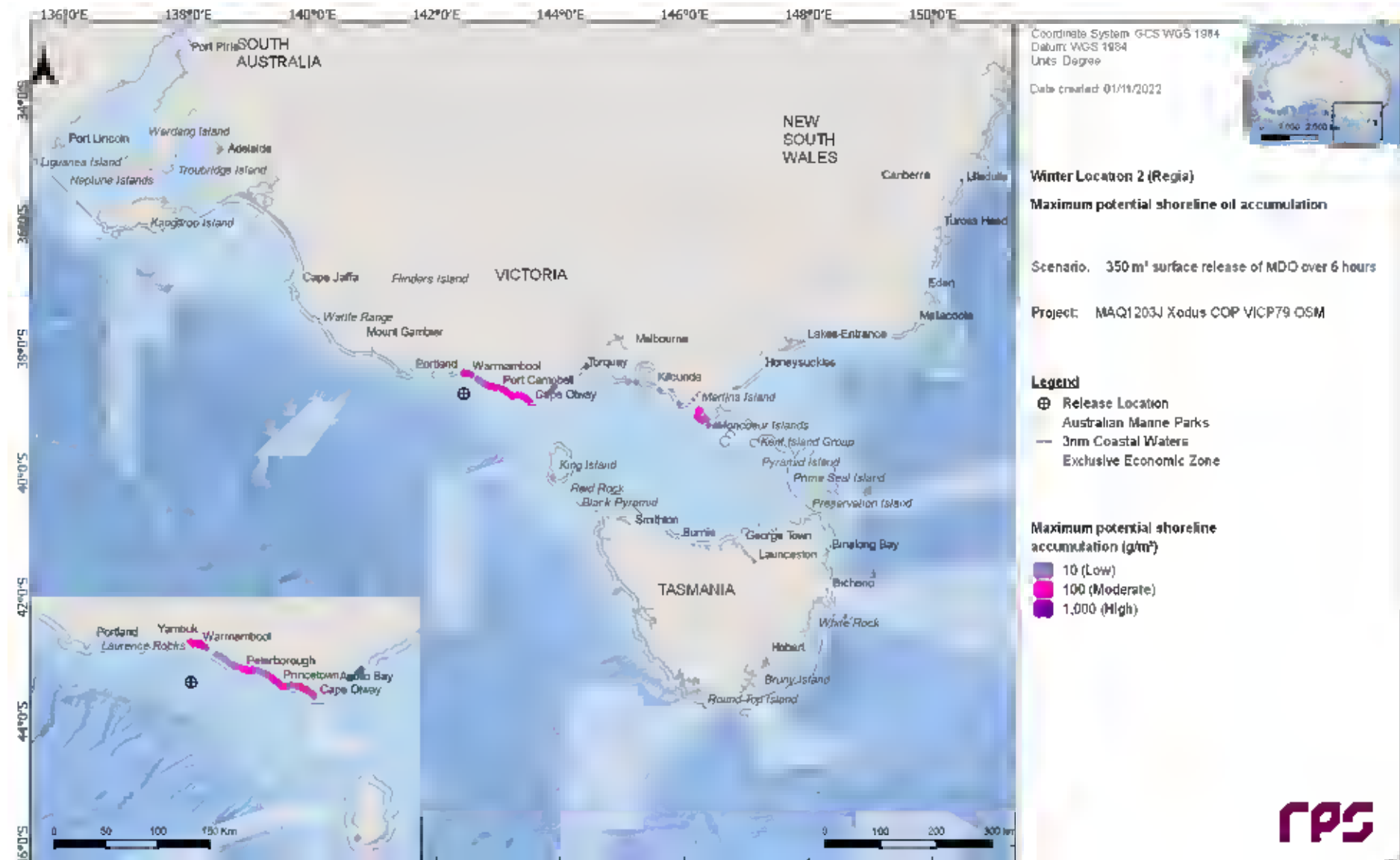


Figure 18.5 Maximum potential shoreline loading from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

18.2.3 In-water exposure

18.2.3.1 Dissolved Hydrocarbons

Table 18.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 18.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 18.6 and Figure 18.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 18.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	97	6	-
	Maximum distance (km) from release location (99 th percentile)	55	6	-
	Direction	W	ENE	-
Winter	Maximum distance (km) from release location	159	6	-
	Maximum distance (km) from release location (99 th percentile)	131	6	-
	Direction	E	NNW	-

Table 18.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer					Winter		
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High rate
AMP	Apollo	4	-	-	-	19	1	-	-
IBRA	Otway Ranges	7	-	-	-	14	1	-	-
IMCRA	Central Bass Strait	3	-	-	-	17	1	-	-
	Otway	82	32	4	-	98	58	7	-
MNP	Twelve Apostles	10	-	-	-	15	1	-	-
State Waters	Victoria	12	1	-	-	19	1	-	-



Figure 18.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

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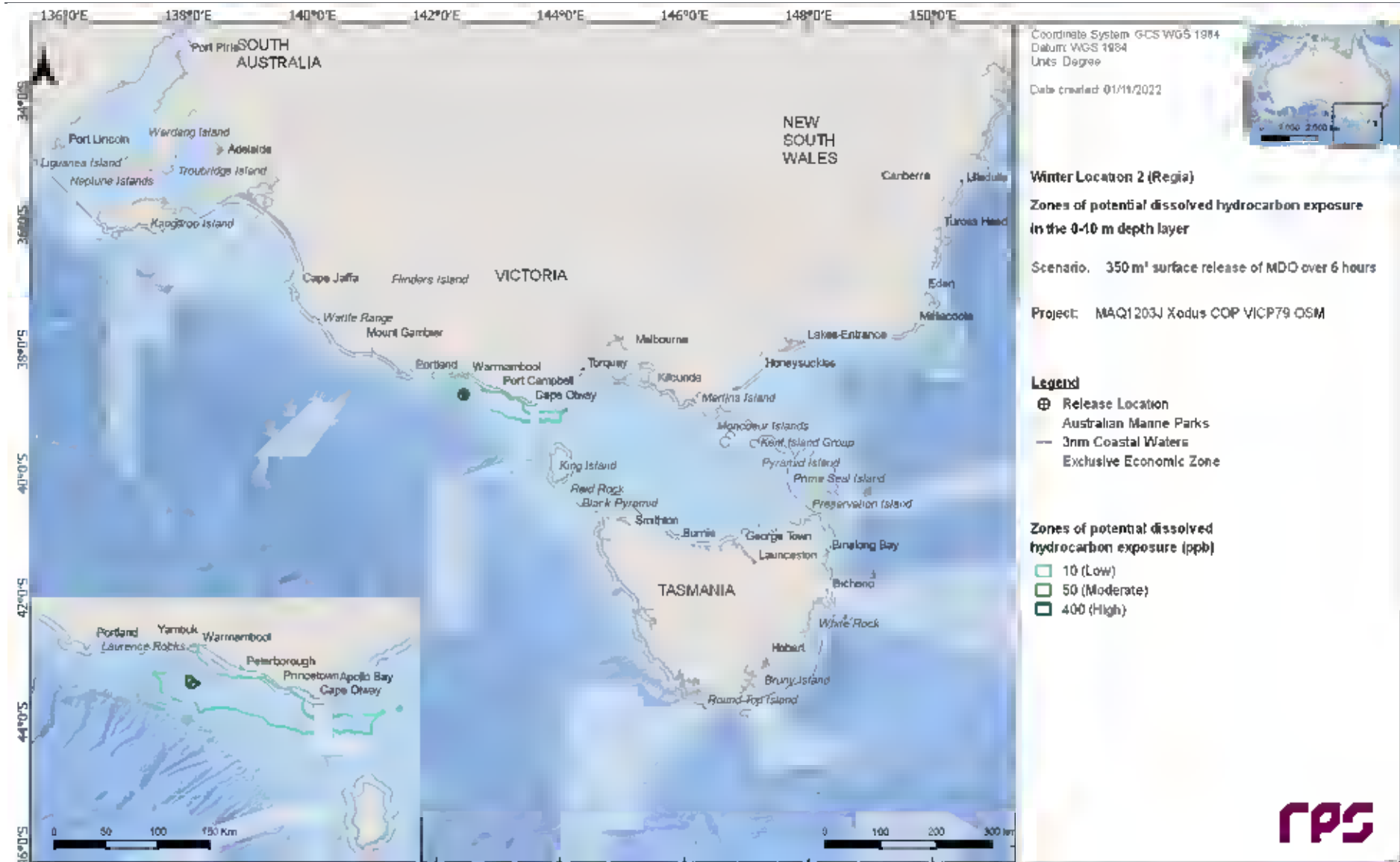


Figure 18.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

18.2.3.2 Entrained Hydrocarbons

Table 18.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 18.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 18.8 and Figure 18.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 18.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	342	163
	Maximum distance (km) from release location (99 th percentile)	286	150
	Direction	E	ESE
Winter	Maximum distance (km) from release location	446	185
	Maximum distance (km) from release location (99 th percentile)	397	176
	Direction	E	E

Table 18.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 2 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer			Winter		
		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
			Low	High		Low	High
AMP	Apollo	287	20	1	270	56	6
	Beagle	3	-	-	21	10	-
	Franklin	13	1	-	9	-	-
	Zeehan	55	3	-	32	4	-
IBRA	Bridgewater	53	5	-	6	-	-
	Flinders	2	-	-	15	2	-
	Gippsland Plain	16	2	-	33	3	-
	Glenelg Plain	40	10	-	10	1	-
	King Island	11	1	-	17	3	-
	Otway Plain	163	27	3	259	47	4
	Otway Ranges	133	29	4	272	40	5
	Strzelecki Ranges	8	-	-	24	1	-
	Warrnambool Plain	307	31	7	513	39	8
	Wilson's Promontory	19	2	-	56	10	-
IMCRA	Central Bass Strait	255	12	1	257	49	6
	Central Victoria	275	14	1	236	52	7
	Flinders	20	2	-	56	11	-
	Otway	6,732	98	85	8,310	95	90
	Twofold Shelf	2	-	-	15	3	-
	Victorian Embayments	5	-	-	13	1	-
KEF	Bonney Coast Upwelling	212	22	4	126	5	1
	West Tasmania Canyons	123	8	2	55	4	-
MNP	Bunurong	12	1	-	8	-	-
	Discovery Bay	53	5	-	3	-	-
	Point Addis	11	1	-	12	2	-
	Twelve Apostles	404	34	11	481	39	8
	Wilson's Promontory	18	2	-	56	9	-
MP	Lower South East	15	3	-	-	-	-
MS	Marengo Reefs	45	5	-	46	13	-
	Merri	49	8	-	431	5	1
	The Arches	102	23	1	163	14	2
Nearshore Waters	Anser Island	12	2	-	37	7	-
	Bass Coast	11	1	-	8	-	-
	Black Pyramid	12	1	-	8	-	-
	Colac Otway	163	27	3	259	47	4
	Corangamite	305	30	6	368	39	8
	Curtis Island	2	-	-	15	2	-
	Glenelg	53	9	-	10	1	-

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	Glennie Group	18	2	-	56	8	-
	Grant	17	3	-	-	-	-
	Hogan Island Group	2	-	-	12	2	-
	Kanowna Island	11	1	-	38	8	-
	Kent Island Group	-	-	-	10	1	-
	King Island	9	-	-	17	3	-
	Lady Julia Percy Island	122	13	1	4	-	-
	Laurence Rocks	37	10	-	8	-	-
	Moncoeur Islands	1	-	-	24	10	-
	Mornington Peninsula	10	-	-	12	2	-
	Moyne	307	27	4	285	19	2
	Norman Island	19	2	-	36	4	-
	Phillip Island	2	-	-	18	1	-
	Reid Rock	8	-	-	11	1	-
	Rodondo Island	2	-	-	26	10	-
	Shellback Island	15	2	-	35	3	-
	Skull Rock	9	-	-	38	8	-
	South Gippsland	18	2	-	35	6	-
	Surf Coast	14	1	-	23	4	-
	Warrnambool	81	11	-	513	6	1
NP	Kent Group	83	30	-	91	77	-
	Bunurong Marine Park	11	1	-	8	-	-
NPS4	Wilson's Promontory Marine Park	17	2	-	33	4	-
	Wilson's Promontory Marine Reserve	17	2	-	55	7	-
	Bell Reef	7	-	-	10	1	-
RSB	Bravenes Rock	127	25	2	181	55	7
	Cody Bank	28	3	-	31	2	-
	Cutter Rock	1	-	-	13	3	-
State Waters	South Australia	20	3	-	-	-	-
	Tasmania	15	1	-	28	5	-
	Victoria	414	35	11	551	53	9

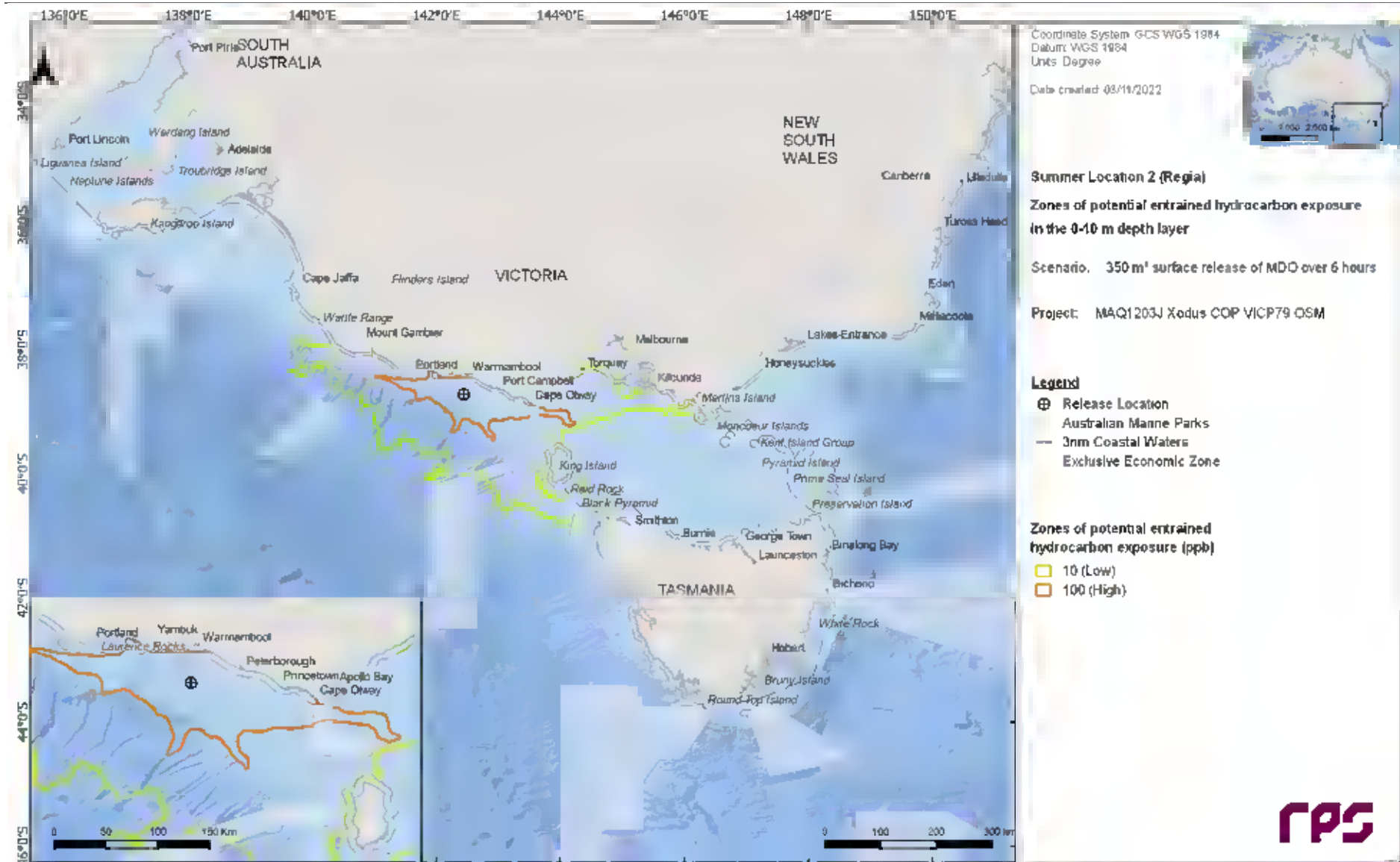


Figure 18.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during summer conditions. The results were calculated from 100 spill simulations.

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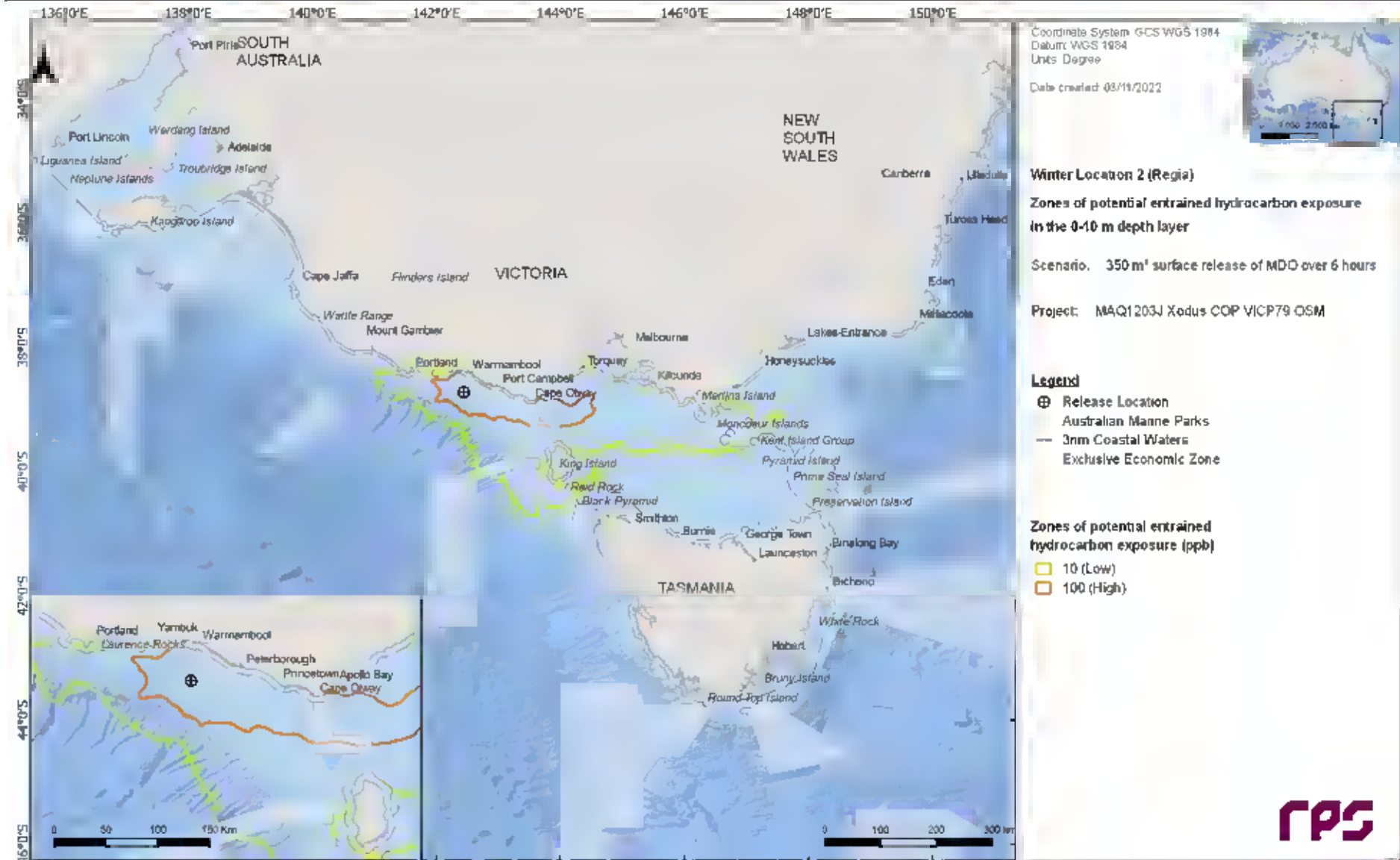


Figure 18.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 2 during winter conditions. The results were calculated from 100 spill simulations.

18.3 Deterministic Analysis

18.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 6 pm 9th August 2010.

Figure 18.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on within 2 days of the release event.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 18.11 and Figure 18.12, respectively.

Figure 18.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 167 m³ (~48%) was lost to the atmosphere through evaporation. Approximately, 103 m³ (~29%) of the released volume decayed, while approximately 64 m³ (~18%) was predicted to remain within the water column and approximately 20 m³ (~6%) was present on the shorelines.

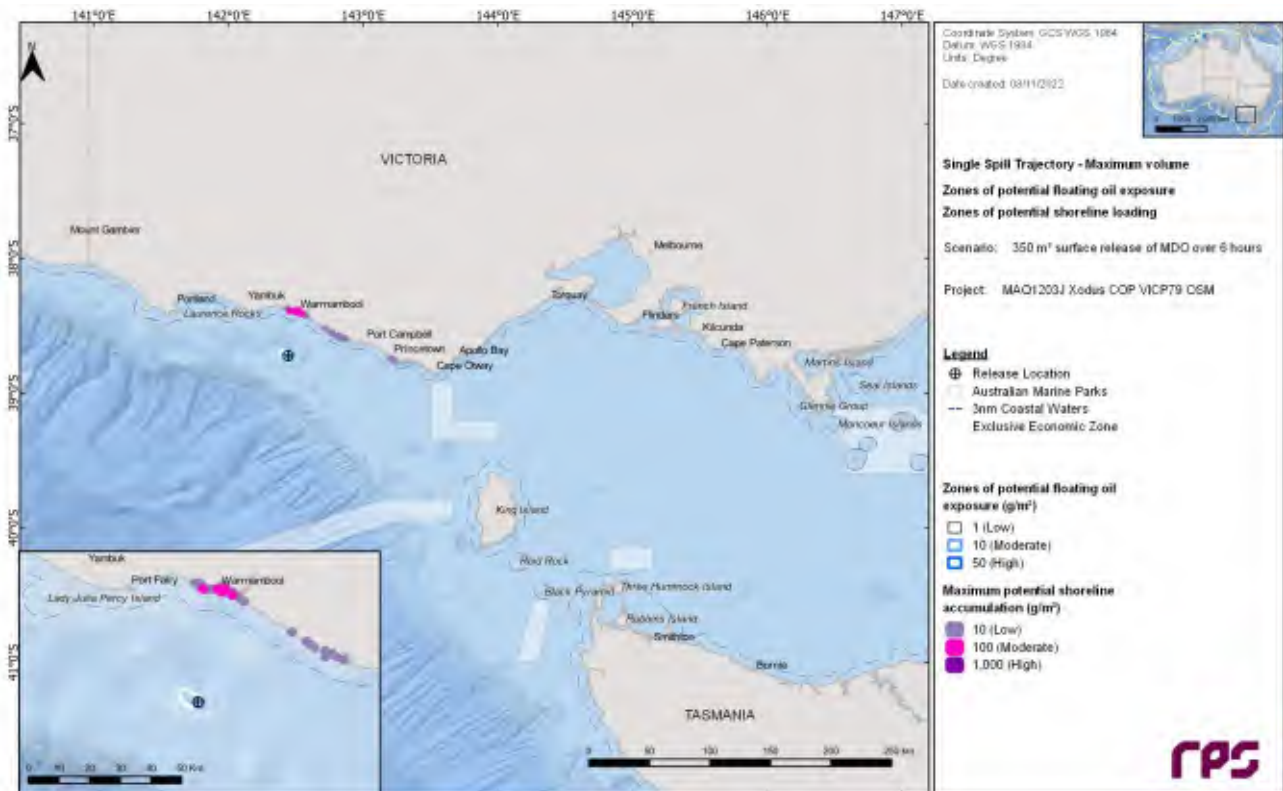


Figure 18.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

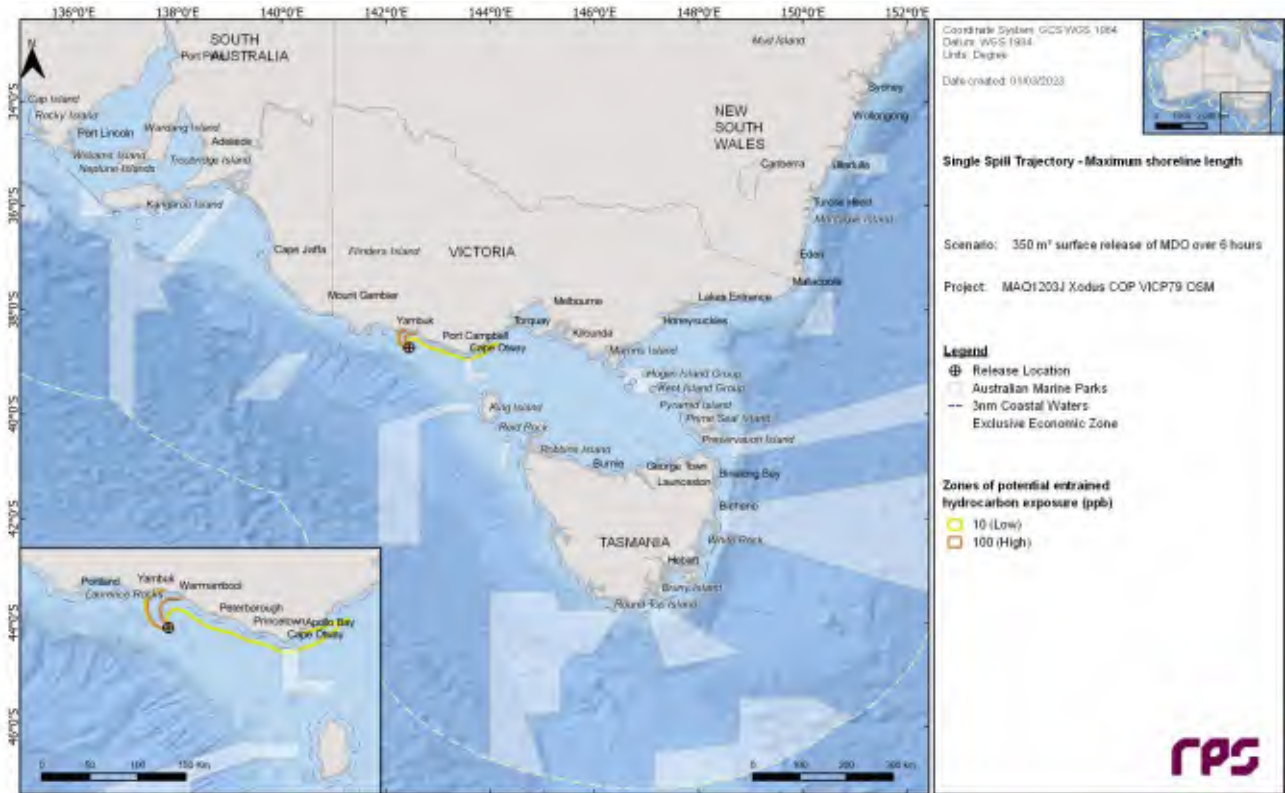


Figure 18.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

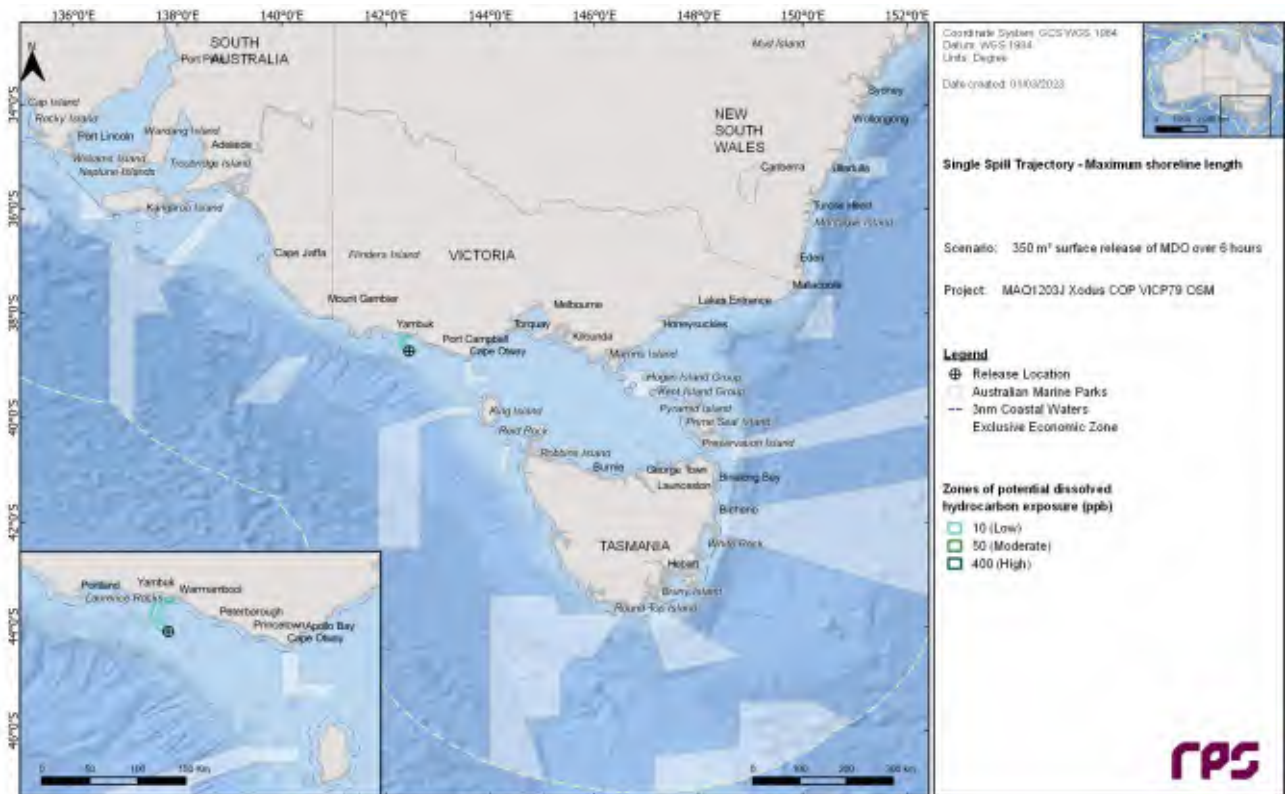


Figure 18.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

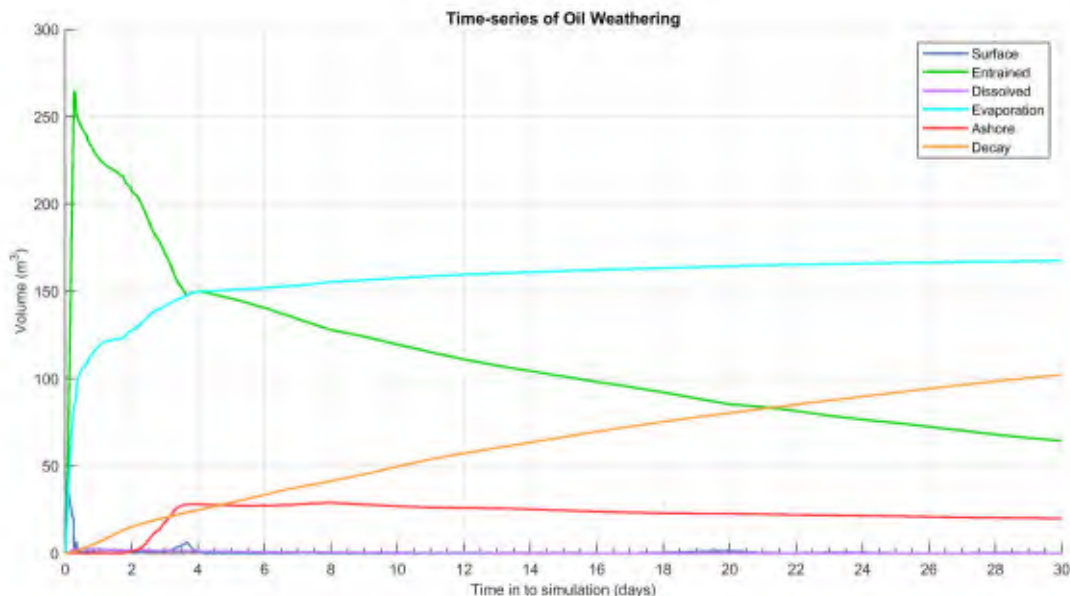


Figure 18.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 2.

18.3.2 Longest Length of Shoreline Accumulation

The simulation that resulted in the longest length of hydrocarbons ashore of 32 km was identified as run number 12 which commenced during winter conditions, 2 pm 1st August 2018.

Figure 18.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 2 of the simulation.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 18.15 and Figure 18.16, respectively.

Figure 18.17 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 170 m³ (~48%) was lost to the atmosphere through evaporation. Approximately, 102 m³ (~29%) of the released volume decayed, while approximately 64 m³ (~18%) was predicted to remain within the water column and approximately 20 m³ (6%) remained on shorelines.

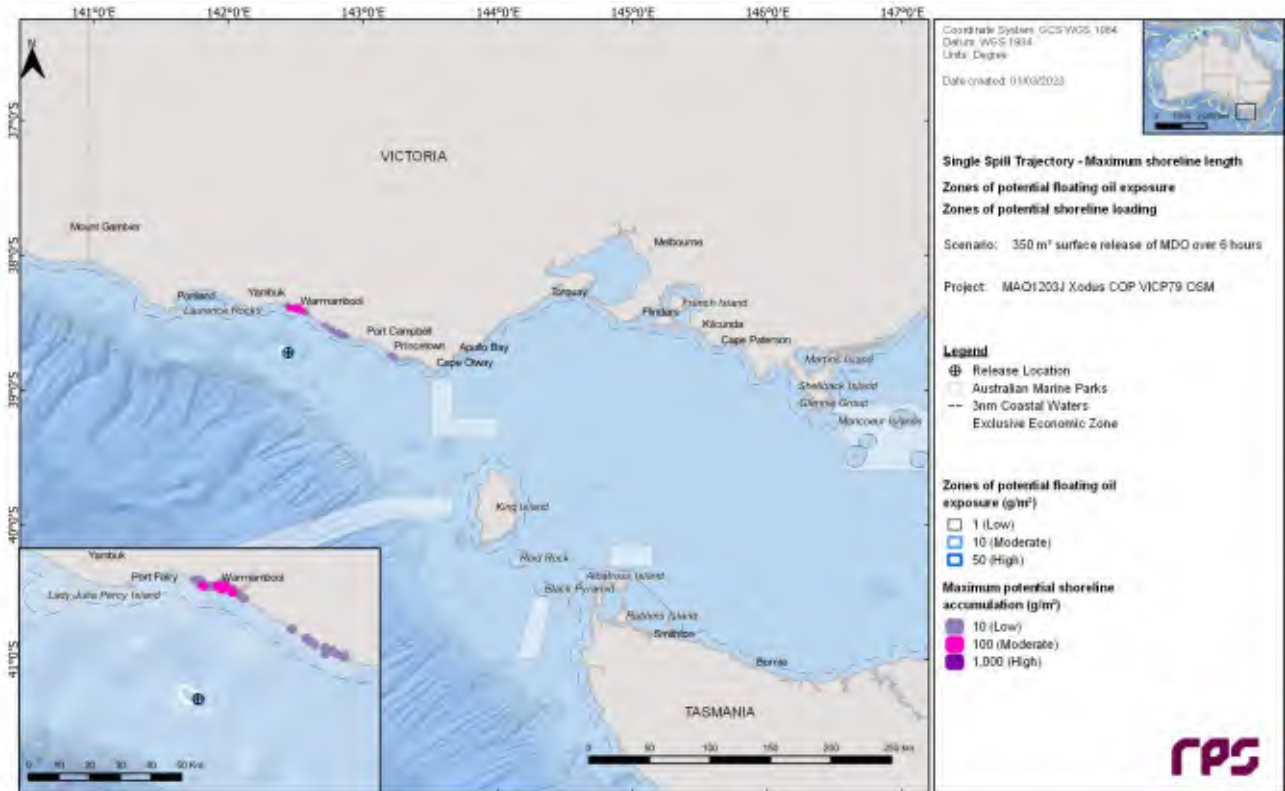


Figure 18.14 Predicted extent of the floating hydrocarbon exposure and shoreline loading over the entire 30 days for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

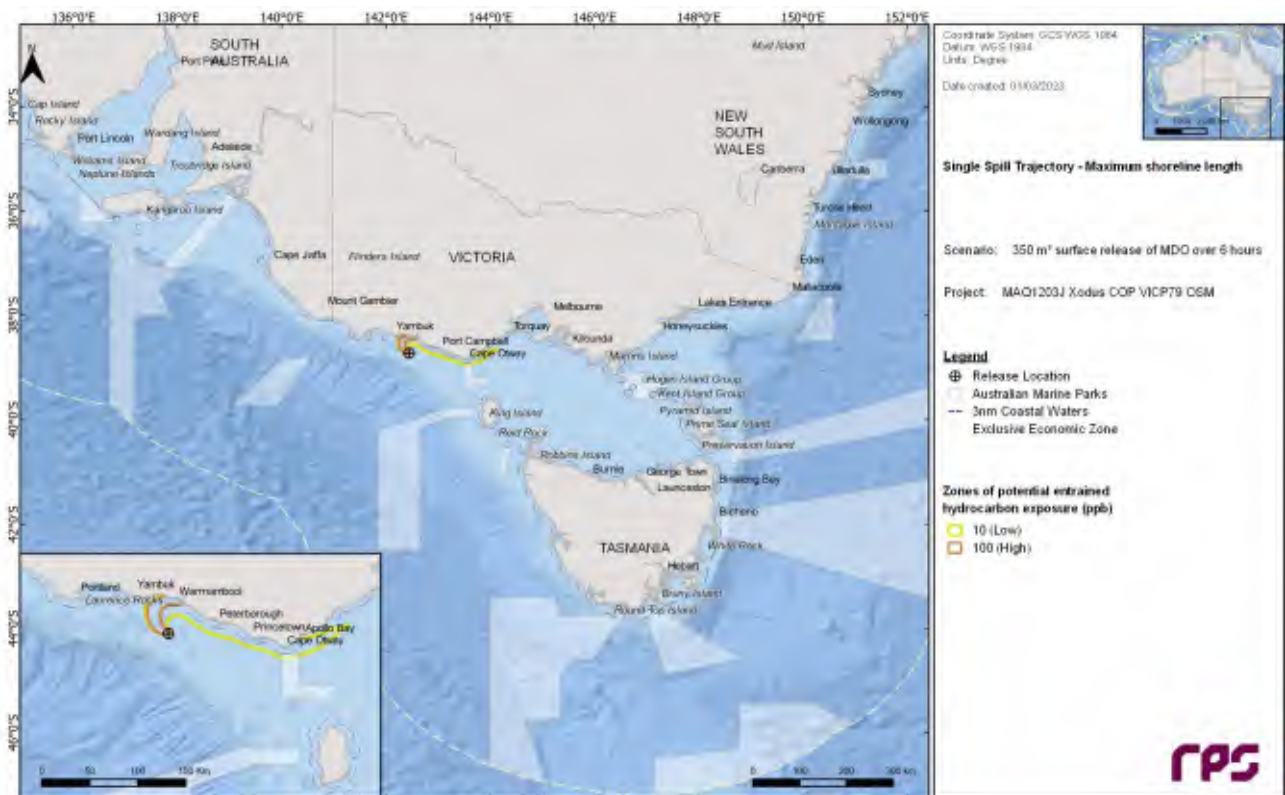


Figure 18.15 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

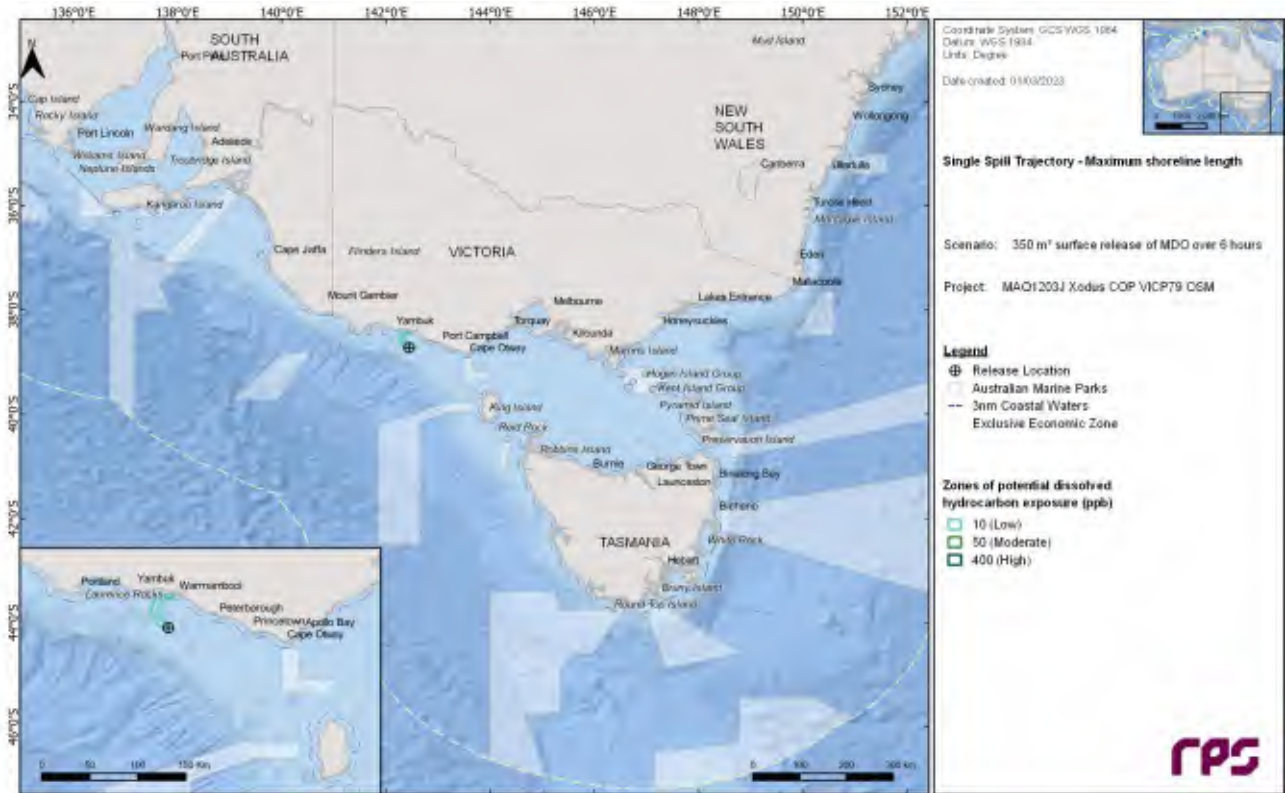


Figure 18.16 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

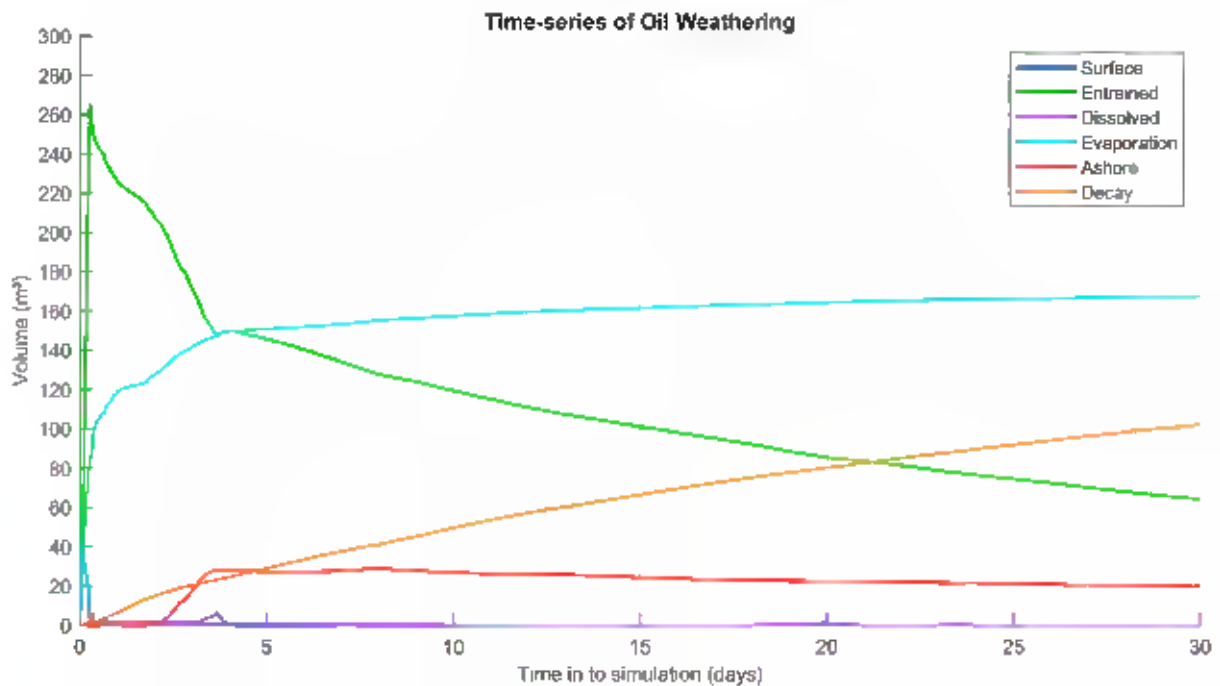


Figure 18.17 Predicted weathering and fates for the simulation that led to the longest length of shoreline accumulation from a vessel collision at Location 2.

19 LOCATION 3 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 3. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 19.1 presents the EMBA, Section 19.2 shows the seasonal (or stochastic) results, while Section 19.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

19.1 EMBA

Figure 19.1 shows the EMBA for Location 3. The EMBA encompasses the outer extent of all 200 seasonal spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

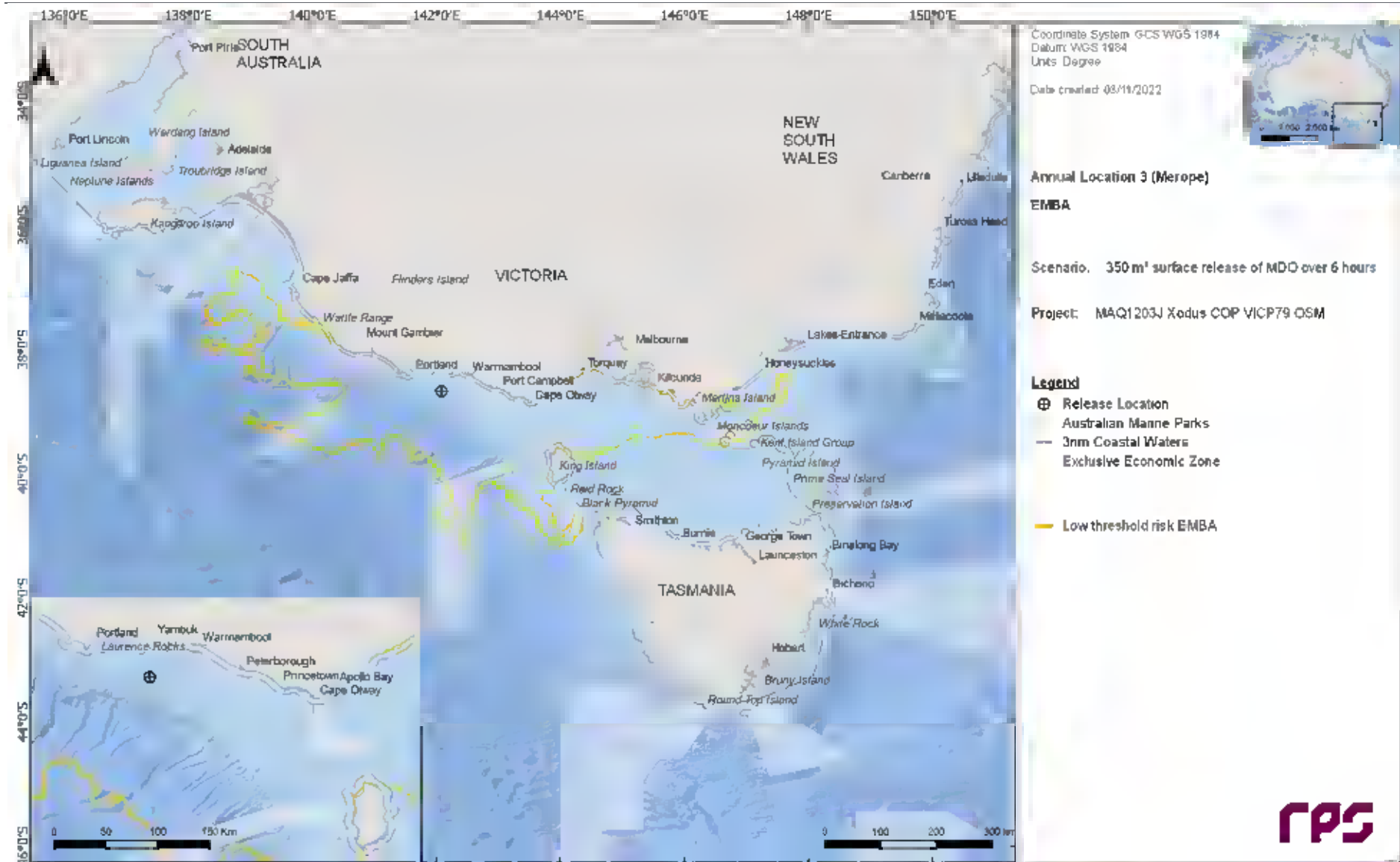


Figure 19.1 Predicted low threshold EMBA from a vessel collision at Location 3. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

19.2 Stochastic Analysis

19.2.1 Floating Oil Exposure

Table 19.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 19.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 19.2 to Figure 19.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating hydrocarbon exposure at or above the low exposure threshold of 139.5 km² was identified as run number 3 and commenced during summer conditions, 9 am 31st March 2010. In comparison the largest swept area of floating hydrocarbon at or above the low exposure threshold occurring during winter was 125.0 km².

Table 19.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	51.8	12.8	8.0
	Maximum distance (km) from release location (99 th percentile)	35.6	12.4	8.0
	Direction	ENE	NE	NE
Winter	Maximum distance (km) from release location	29.1	19.8	4.2
	Maximum distance (km) from release location (99 th percentile)	28.1	18.7	4.2
	Direction	ESE	ESE	WNW

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Table 19.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 3 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
IBRA	Warrnambool Plain	-	-	-	-	-	-	-	-	-	-	-	-
IMCRA	Otway	100	100	17	0.04	0.04	0.04	100	100	18	0.04	0.04	0.04
KEF	Bonney Coast Upwelling	1	-	-	1.38	-	-	-	-	-	-	-	-
MNP	Twelve Apostles	-	-	-	-	-	-	-	-	-	-	-	-
State Waters	Victoria	-	-	-	-	-	-	-	-	-	-	-	-

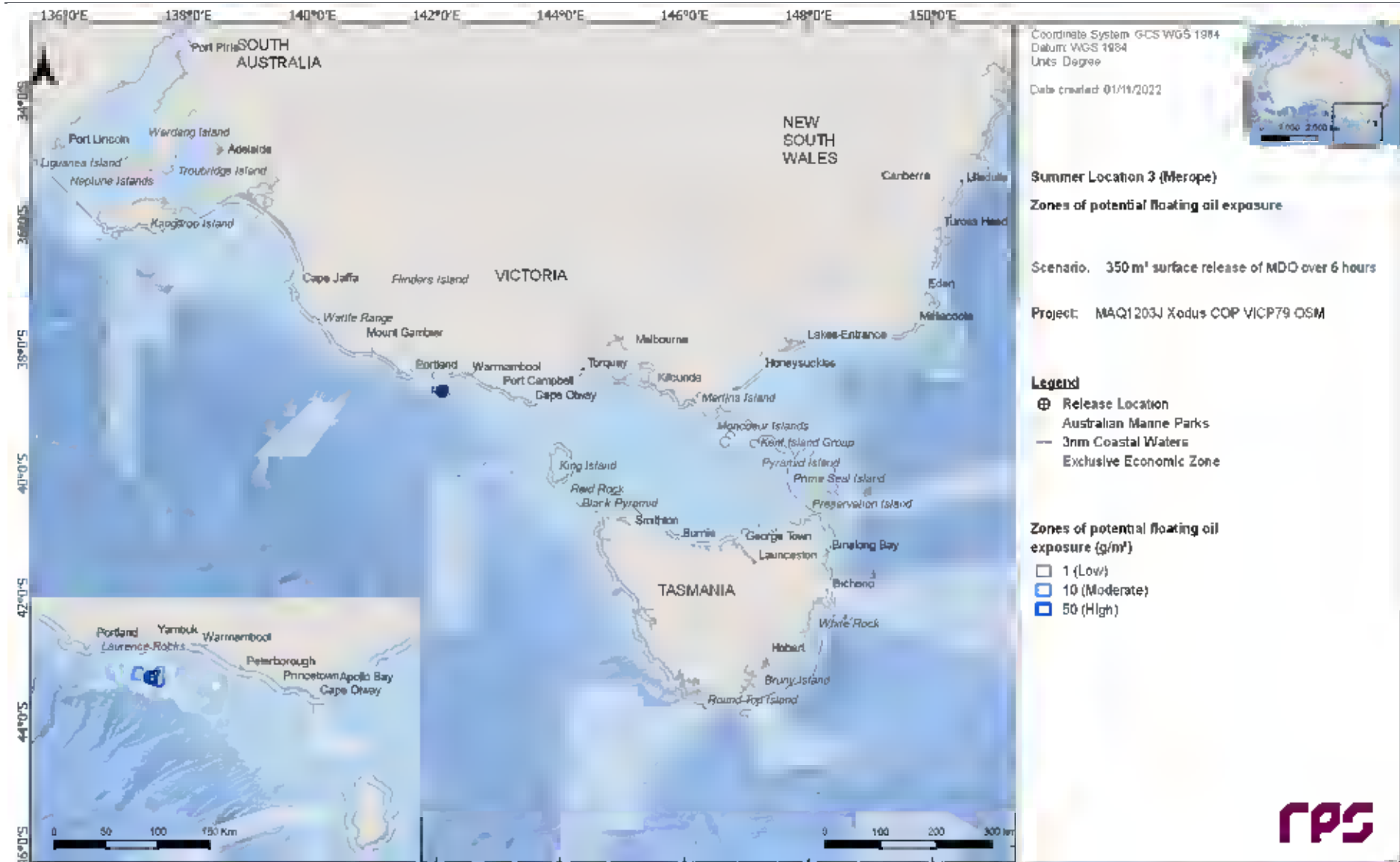


Figure 19.2 Zones of potential floating oil exposure from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

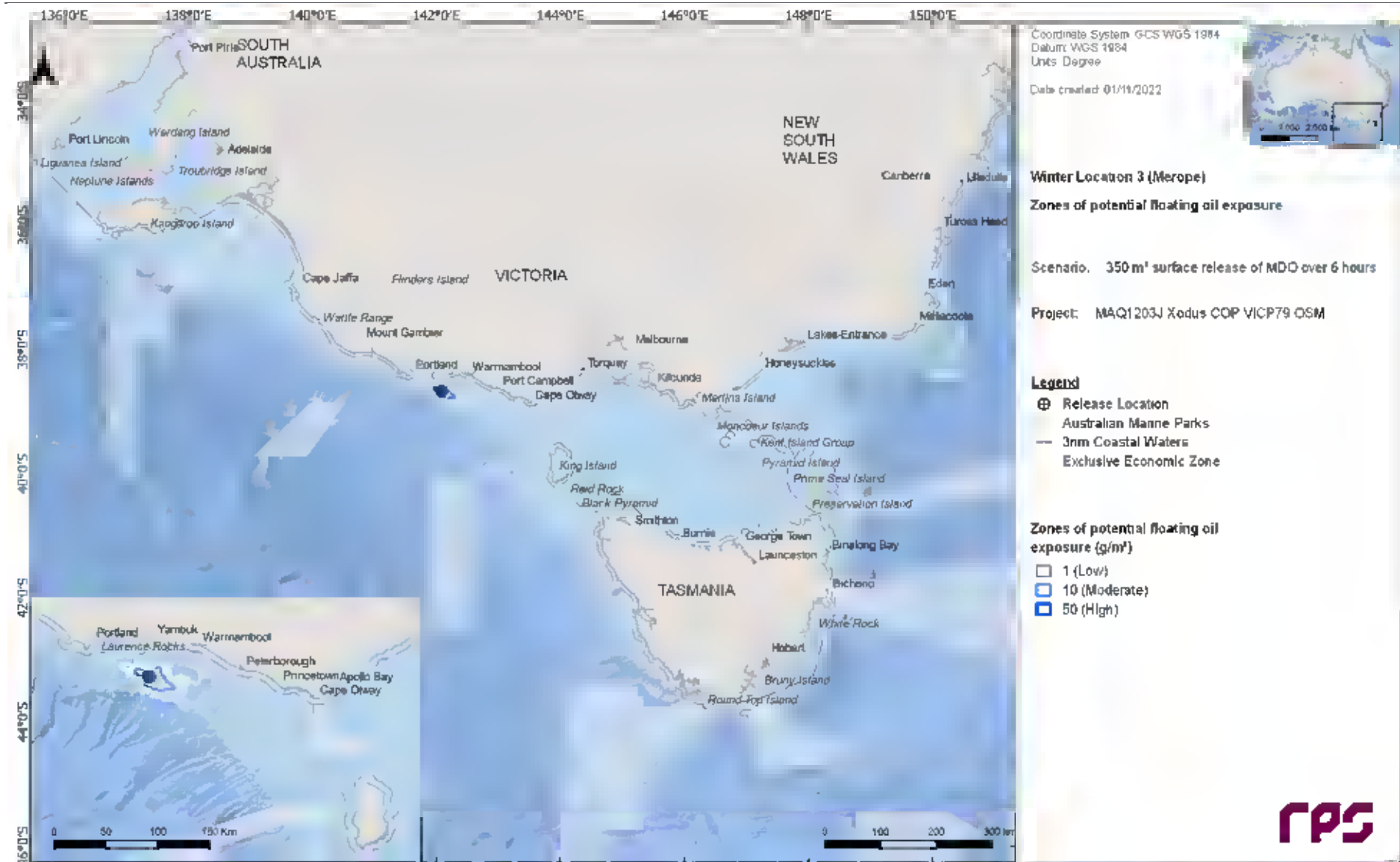


Figure 19.3 Zones of potential floating oil exposure from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

19.2.2 Shoreline Accumulation

Table 19.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 19.4 and Table 19.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 19.4 and Figure 19.5.

Table 19.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 3 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	41	30
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	3.29	3.17
Maximum volume of hydrocarbons ashore (m ³)	9.8	18.0
Average volume of hydrocarbons ashore (m ³)	2.9	4.5
Maximum length of the shoreline at 10 g/m² (km)	18	29
Average shoreline length (km) at 10 g/m² (km)	7.1	7.8
Maximum length of the shoreline at 100 g/m² (km)	3	5
Average shoreline length (km) at 100 g/m² (km)	2	3.3
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 19.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 3 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Colac Otway	6	2	-	5.25	6.17	-	29	176	0.5	7.5	7.6	1.9	-	11.5	2.9	-
Corangamite	12	1	-	4.92	5.83	-	26	203	0.6	5.6	4.6	1.9	-	11.5	1.9	-
Glenelg	13	1	-	5.38	12.71	-	20	120	0.7	3.8	5.1	1	-	12.4	1	-
Glennie Group	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Grant	1	-	-	15.88	-	-	15	15	1.3	1.3	1	-	-	1	-	-
Kanowna Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
King Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lady Julia Percy Island	3	-	-	10.71	-	-	18	28	< 0.1	0.3	1	-	-	1	-	-
Laurence Rocks	3	-	-	7.21	-	-	24	49	< 0.1	0.8	1.9	-	-	1.9	-	-
Moncoeur Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moyne	14	2	-	3.29	3.63	-	21	186	0.9	8.1	5.5	1.4	-	14.3	1.9	-
Norman Island	-	-	-	-	-	-	-	-	< 0.1	0.1	-	-	-	-	-	-
Rodondo Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shellback Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Skull Rock	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
South Gippsland	1	-	-	20.54	-	-	14	14	0.6	0.6	2.9	-	-	2.9	-	-
Warrnambool	6	-	-	5.88	-	-	16	35	0.2	2.6	3.3	-	-	6.7	-	-

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Table 19.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 3 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Colac Otway	11	1	-	4.46	6.46	-	19	143	1	15.4	5.8	1.9	-	27.7	1.9	-
Corangamite	11	2	-	3.75	4.83	-	37	322	1.6	17	5.5	3.3	-	13.4	4.8	-
Glenelg	2	-	-	6.29	-	-	14	22	0.1	1.6	4.3	-	-	4.8	-	-
Glennie Group	1	-	-	19.42	-	-	12	12	0.6	0.6	1.9	-	-	1.9	-	-
Grant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kanowna Island	1	-	-	12.17	-	-	25	25	0.3	0.3	1	-	-	1	-	-
King Island	1	-	-	11.71	-	-	33	33	2.0	2.0	2.9	-	-	2.9	-	-
Lady Julia Percy Island	2	-	-	5.29	-	-	29	43	< 0.1	0.5	1	-	-	1	-	-
Laurence Rocks	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-
Moncoeur Islands	1	-	-	14.63	-	-	17	17	0.6	0.6	2.9	-	-	2.9	-	-
Moyne	7	2	-	4.21	5.13	-	42	262	1.2	14.7	6.1	4.8	-	12.4	4.8	-
Norman Island	1	-	-	16.96	-	-	19	19	0.7	0.7	2.9	-	-	2.9	-	-
Rodondo Island	1	-	-	16.17	-	-	11	11	0.1	0.1	1	-	-	1	-	-
Shellback Island	1	-	-	15.79	-	-	61	61	0.7	0.7	1	-	-	1	-	-
Skull Rock	1	-	-	12.17	-	-	25	25	0.3	0.3	1	-	-	1	-	-
South Gippsland	3	-	-	13.5	-	-	22	98	0.2	3.6	3.5	-	-	6.7	-	-
Warrnambool	3	1	-	3.17	10.83	-	108	108	8.8	8.8	7	1	-	15.3	1	-

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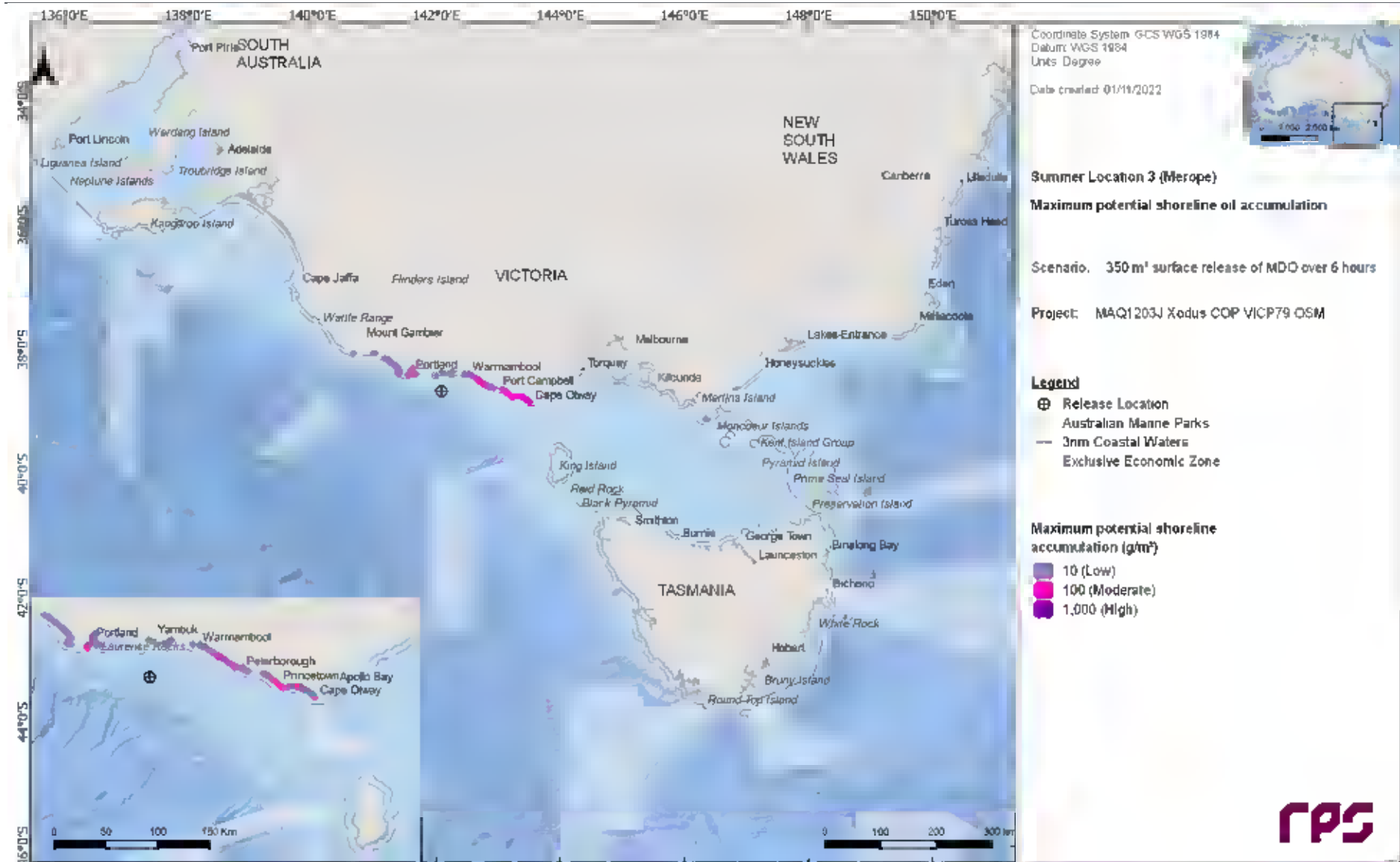


Figure 19.4 Maximum potential shoreline loading from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

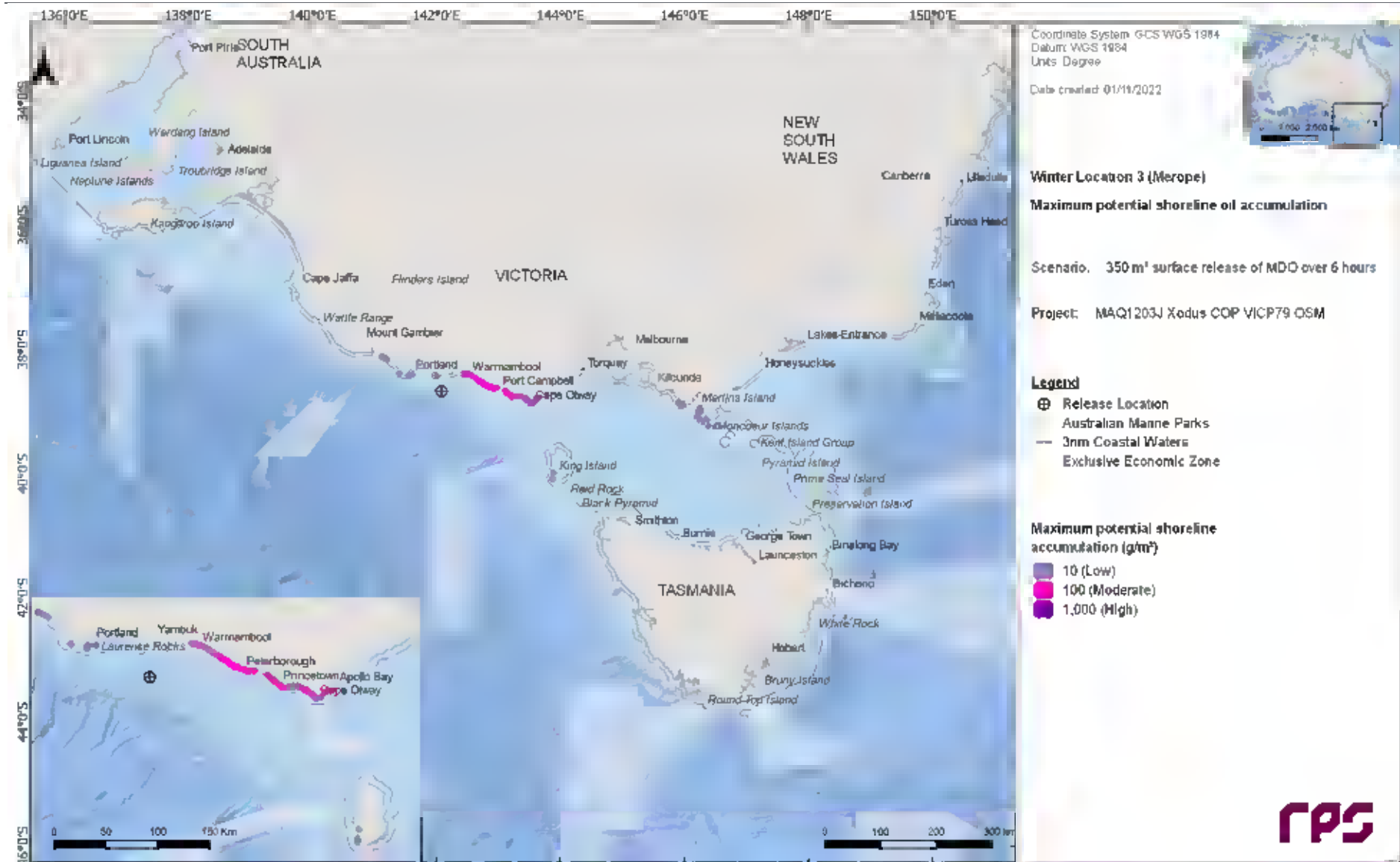


Figure 19.5 Maximum potential shoreline loading from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

19.2.3 In-water exposure

19.2.3.1 Dissolved Hydrocarbons

Table 19.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 19.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 19.6 and Figure 19.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 19.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	98	2	-
	Maximum distance (km) from release location (99 th percentile)	56	2	-
	Direction	WNW	NE	-
Winter	Maximum distance (km) from release location	121	3	-
	Maximum distance (km) from release location (99 th percentile)	108	3	-
	Direction	SE	E	-

Table 19.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer				Winter			
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High
IMCRA	Otway	68	50	4	-	99	52	9	-
KEF	Bonney Coast Upwelling	23	1	-	-	16	1	-	-
State Waters	Victoria	4	-	-	-	11	1	-	-

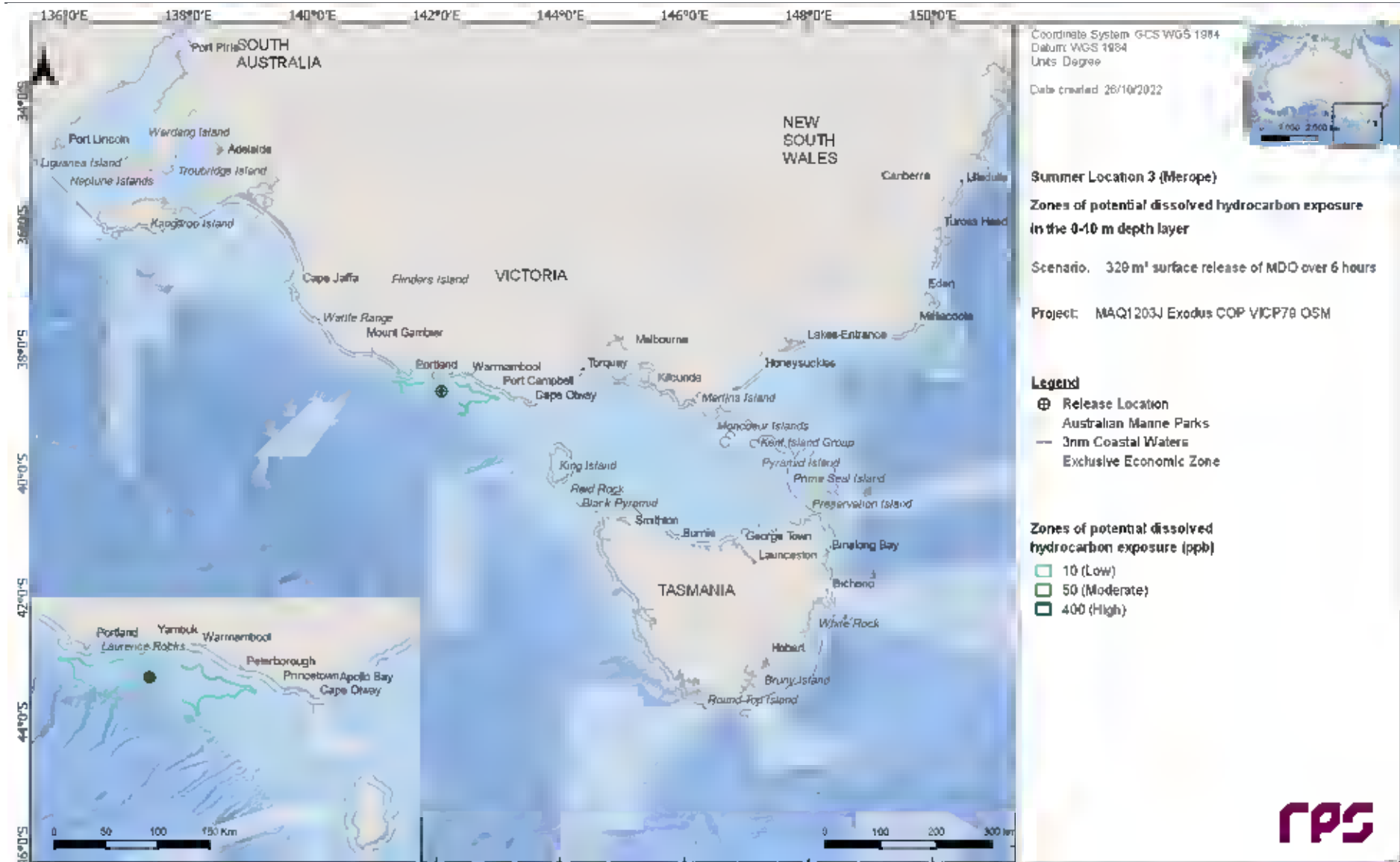


Figure 19.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.

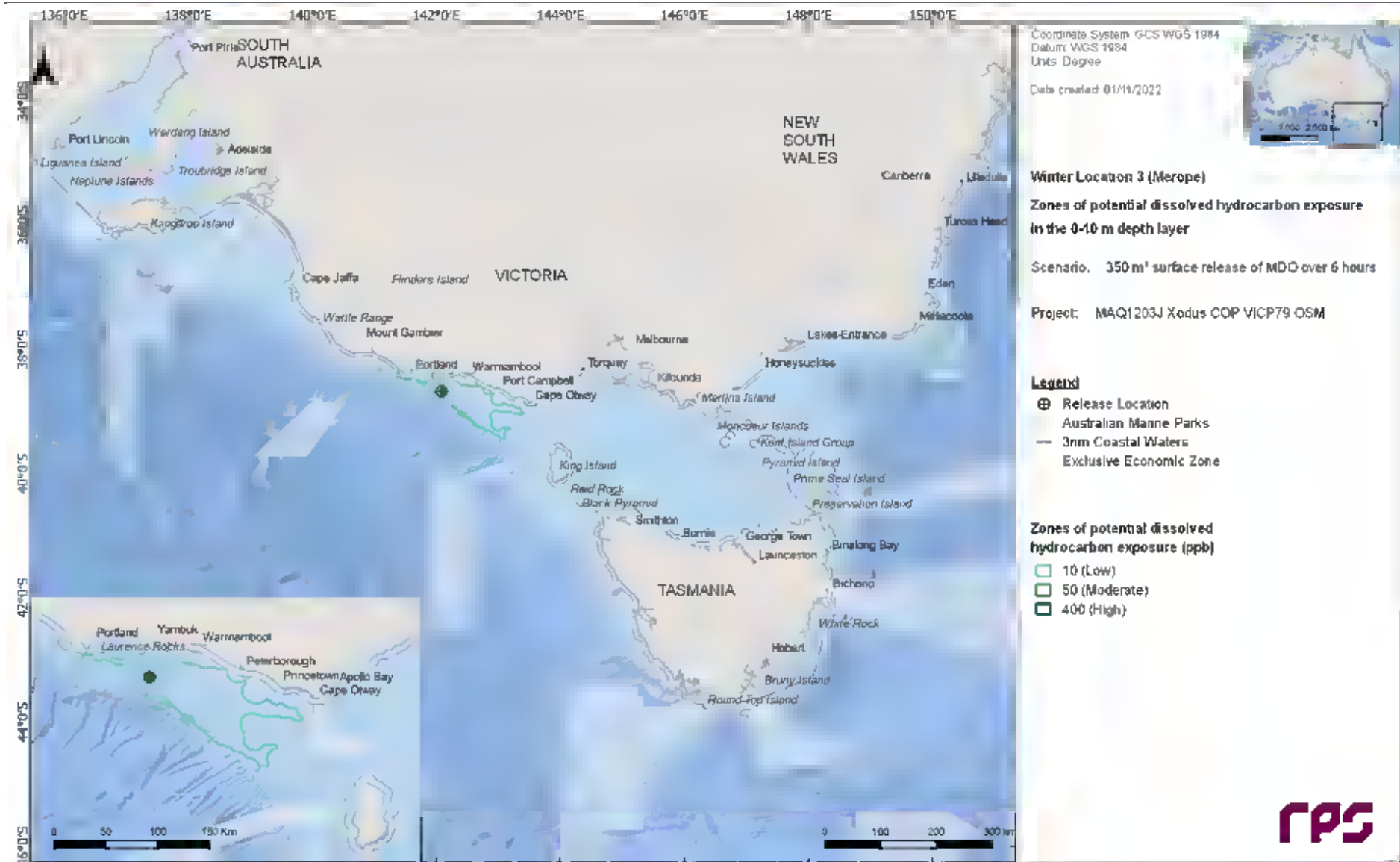


Figure 19.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during winter conditions. The results were calculated from 100 spill simulations.

19.2.3.2 Entrained Hydrocarbons

Table 19.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 19.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 19.8 and Figure 19.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 19.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	379	134
	Maximum distance (km) from release location (99 th percentile)	351	121
	Direction	E	ESE
Winter	Maximum distance (km) from release location	489	187
	Maximum distance (km) from release location (99 th percentile)	450	172
	Direction	E	E

Table 19.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 3 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor	Summer			Winter			
	Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		
		Low	High		Low	High	
AMP	Apollo	104	8	1	177	47	3
	Beagle	4	-	-	25	8	-
	Franklin	6	-	-	12	1	-
	Nelson	19	2	-	10	-	-
	Zeehan	33	5	-	80	3	-
IBRA	Bridgewater	90	14	-	180	2	1
	Flinders	2	-	-	14	2	-
	Gippsland Plain	22	2	-	19	3	-
	Glenelg Plain	102	15	1	109	4	1
	King Island	7	-	-	26	2	-
	Otway Plain	100	12	-	110	25	1
	Otway Ranges	100	15	-	81	26	-
	Strzelecki Ranges	10	1	-	16	2	-
	Warrnambool Plain	185	19	2	298	26	2
	Wilson's Promontory	34	2	-	37	10	-
IMCRA	Central Bass Strait	74	6	-	176	44	3
	Central Victoria	90	7	-	151	43	3
	Coorong	29	3	-	-	-	-
	Flinders	35	2	-	40	10	-
	Franklin	4	-	-	13	1	-
	Otway	7,237	95	91	8,442	93	83
	Twofold Shelf	2	-	-	19	5	-
	Victorian Embayments	10	-	-	11	2	-
KEF	Bonney Coast Upwelling	737	37	12	776	10	4
	West Tasmania Canyons	87	9	-	159	3	1
MNP	Bunurong	3	-	-	11	1	-
	Discovery Bay	110	14	1	251	2	1
	Point Addis	10	1	-	15	3	-
	Twelve Apostles	133	19	1	298	25	2
	Wilson's Promontory	33	1	-	37	5	-
MP	Lower South East	19	3	-	32	8	-
	Marengo Reefs	39	8	-	67	2	-
MS	Merri	56	12	-	119	11	1
	The Arches	19	3	-	32	8	-
	Anser Island	25	1	-	35	3	-
Nearshore Waters	Colac Otway	100	12	-	110	25	1
	Corangamite	111	19	1	298	26	2
	Curtis Island	2	-	-	11	1	-

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	Glenelg	102	15	1	216	4	1
	Glennie Group	32	1	-	35	5	-
	Grant	22	2	-	-	-	-
	Hogan Island Group	-	-	-	14	2	-
	Kanowna Island	23	1	-	37	5	-
	King Island	7	-	-	26	2	-
	Lady Julia Percy Island	77	11	-	22	2	-
	Laurence Rocks	84	18	-	14	1	-
	Moncoeur Islands	3	-	-	24	9	-
	Mornington Peninsula	7	-	-	16	3	-
	Moyne	185	16	2	190	15	2
	Norman Island	32	2	-	24	4	-
	Phillip Island	11	1	-	11	1	-
	Rodondo Island	5	-	-	24	7	-
	Seal Islands	1	-	-	12	1	-
	Shellback Island	19	2	-	17	3	-
	Skull Rock	21	1	-	38	5	-
	South Gippsland	29	2	-	28	4	-
	Surf Coast	14	2	-	16	2	-
	Warrnambool	85	10	-	85	3	-
NPS4	Wilson's Promontory Marine Park	27	2	-	21	3	-
	Wilson's Promontory Marine Reserve	31	1	-	29	4	-
Ramsar	Glenelg Estuary and Discovery Bay Wetlands	69	6	-	8	-	-
	Piccaninnie Ponds Karst Wetlands	18	2	-	-	-	-
RSB	Bravenes Rock	105	13	1	66	29	-
	Cody Bank	11	1	-	14	1	-
	Cutter Rock	6	-	-	15	3	-
State Waters	South Australia	40	4	-	-	-	-
	Tasmania	8	-	-	34	3	-
	Victoria	337	28	3	493	32	5

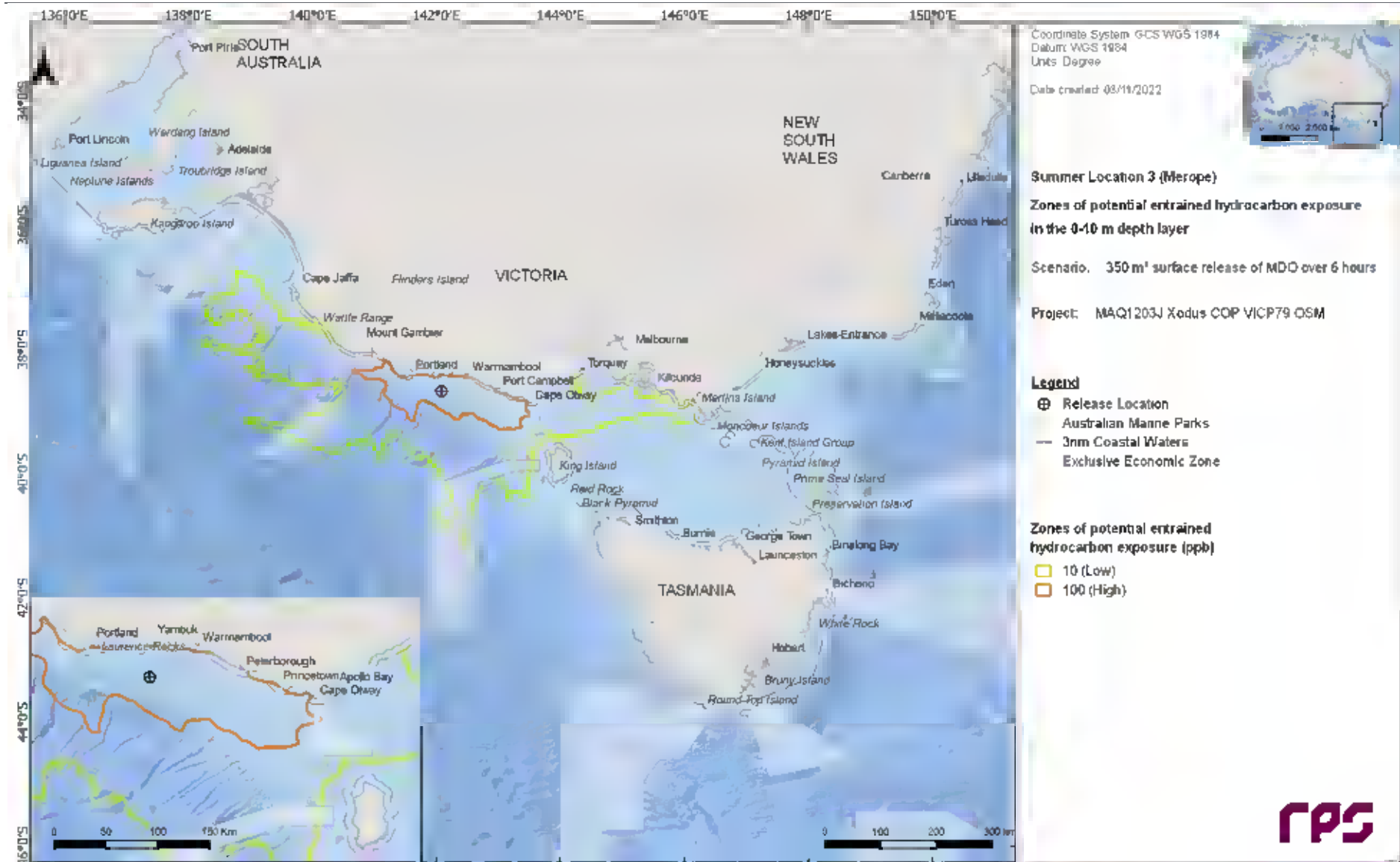
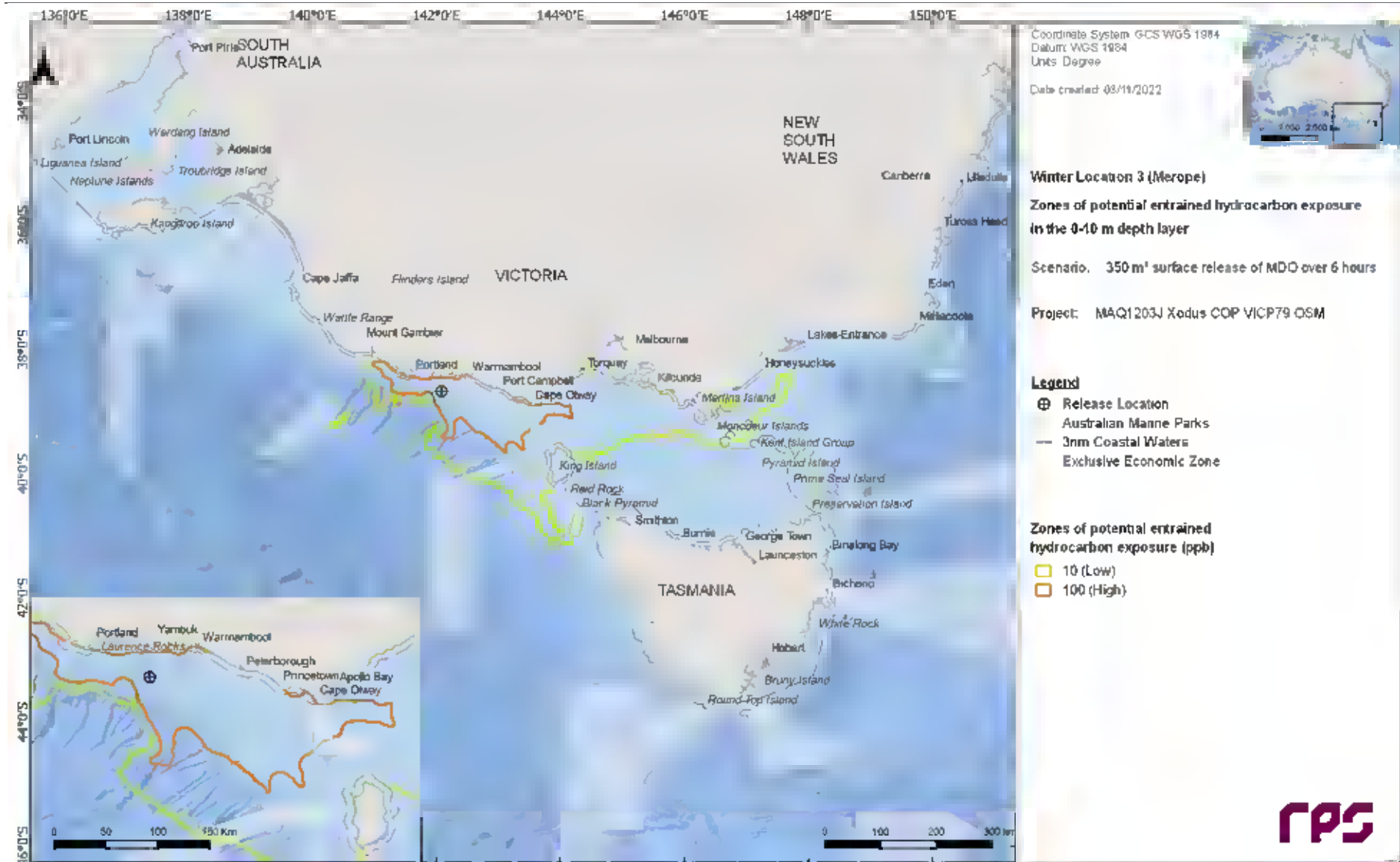


Figure 19.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 3 during summer conditions. The results were calculated from 100 spill simulations.



19.3 Deterministic Analysis

19.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 4 am 17th August 2019.

Figure 19.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 3.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 19.11 and Figure 19.12, respectively.

Figure 19.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 152 m³ (~44%) was lost to the atmosphere through evaporation. Approximately, 105 m³ (~31%) of the released volume decayed, while approximately 80 m³ (~22%) was predicted to remain within the water column and approximately 13 m³ (~4%) was present on the shorelines.

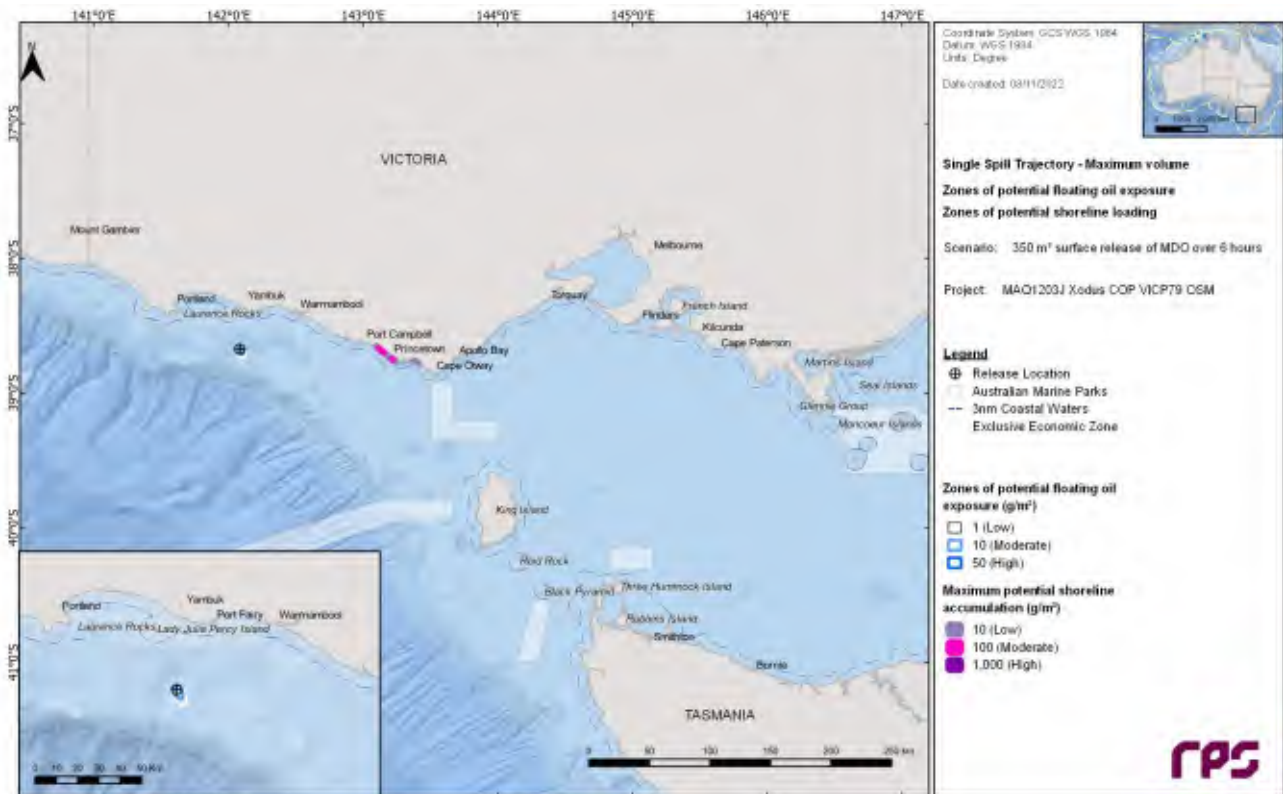


Figure 19.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

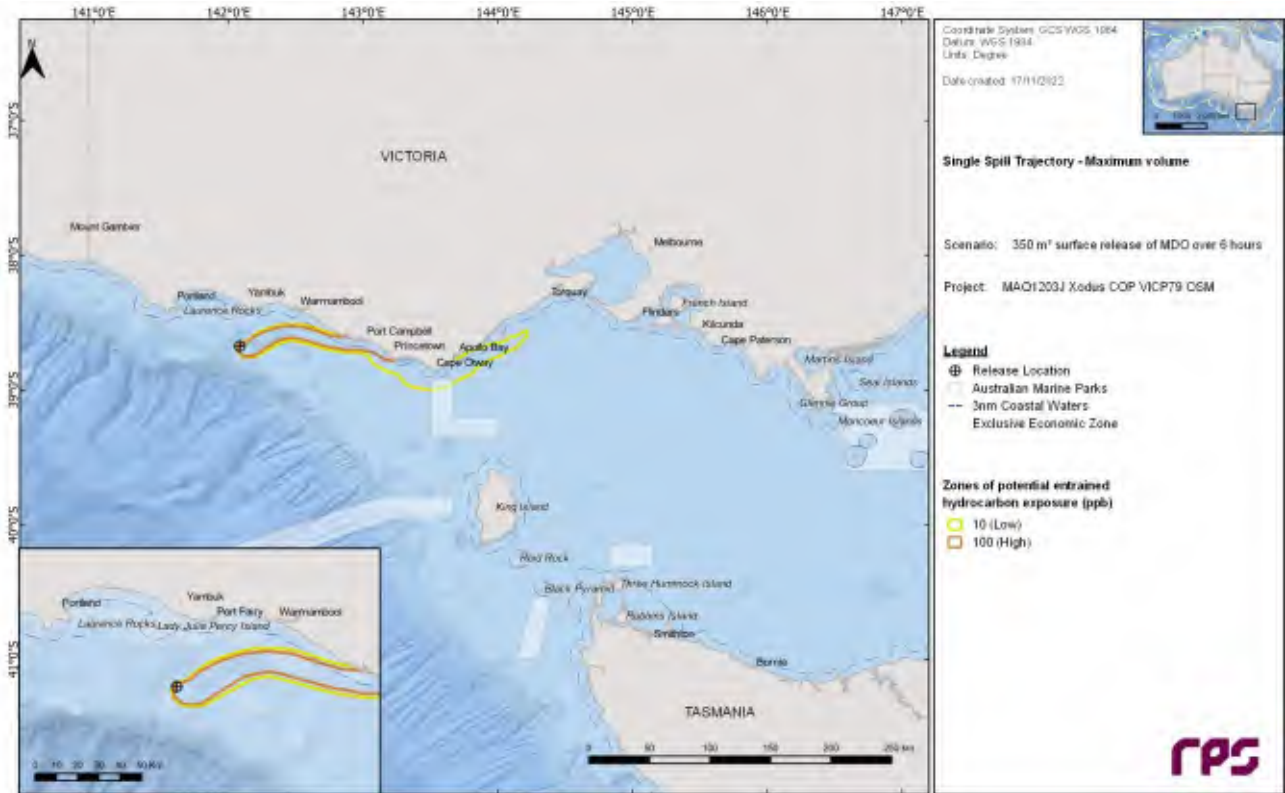


Figure 19.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

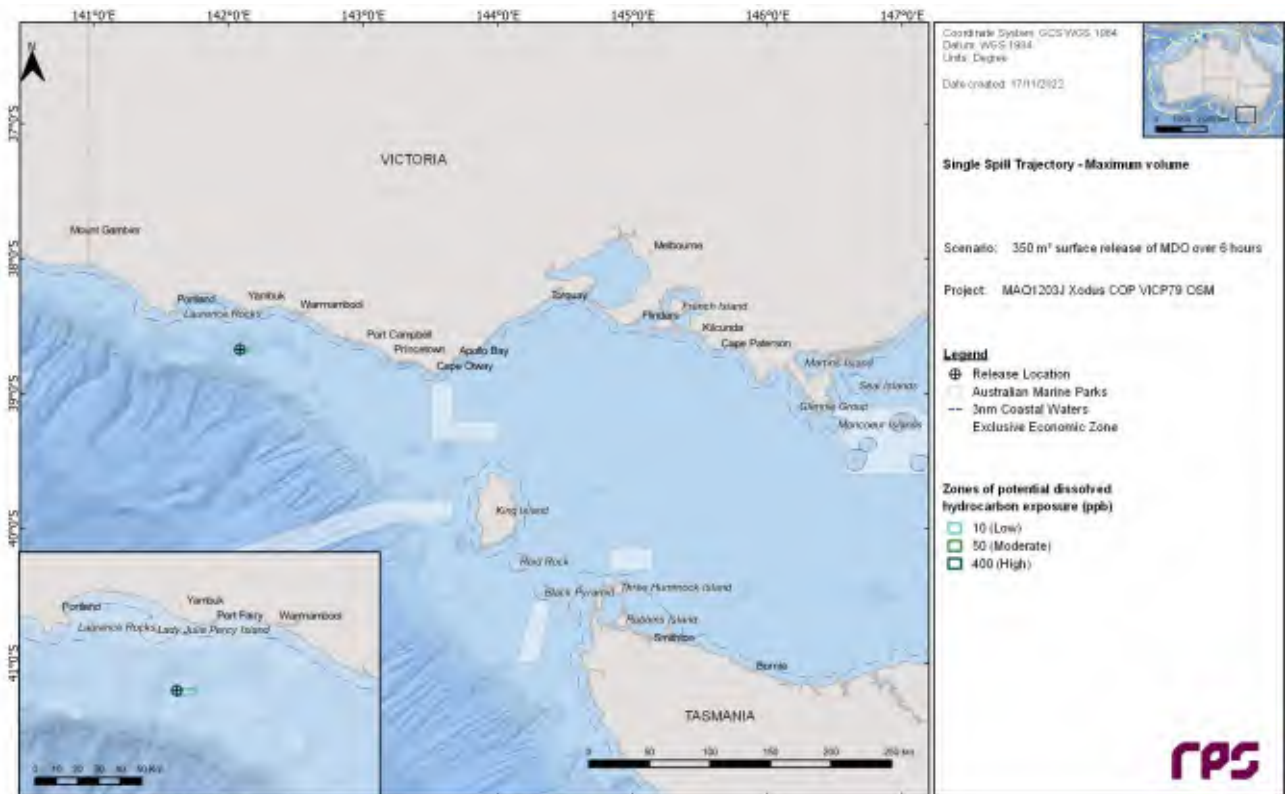


Figure 19.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

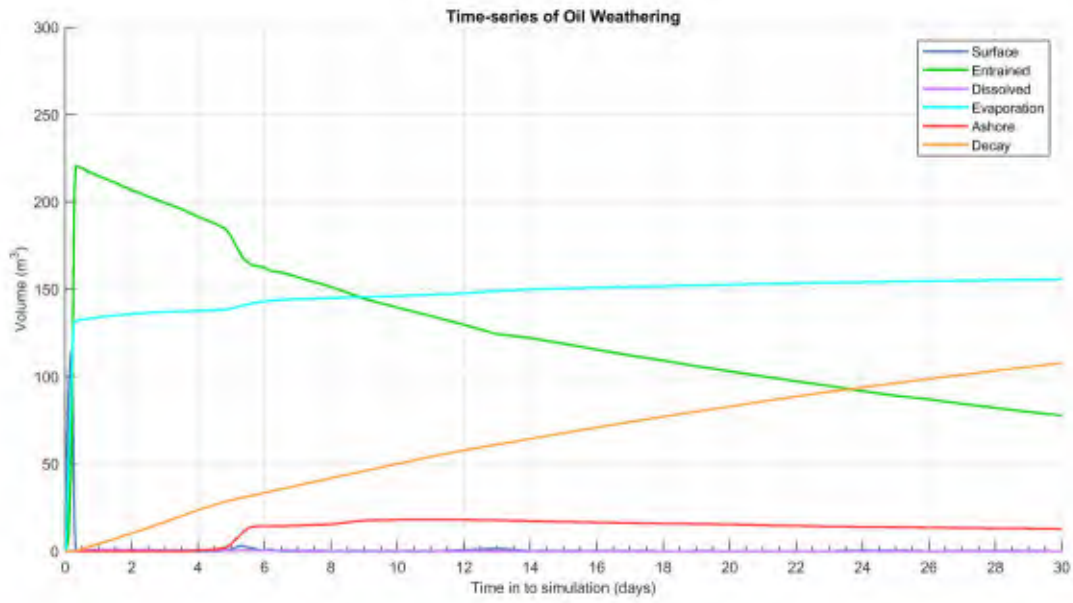


Figure 19.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 3.

20 LOCATION 4 VESSEL COLLISION RESULTS

This scenario examined the potential exposure following a vessel collision at Location 4. A total of 200 spill trajectories were simulated (i.e. 100 spills per season) and tracked for 120 days.

Section 20.1 presents the EMBA, Section 20.2 shows the seasonal (or stochastic) results, while Section 20.3 presents in more detail the results for the simulation resulting in the largest volume of hydrocarbons ashore.

20.1 EMBA

Figure 20.1 shows the EMBA for Location 4. The EMBA encompasses the outer extent of all 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components (1 g/m² floating, 10 ppb dissolved and entrained, 10 g/m² shoreline) and includes all probabilities of exposure. The EMBA does not represent the reach of an individual spill event.

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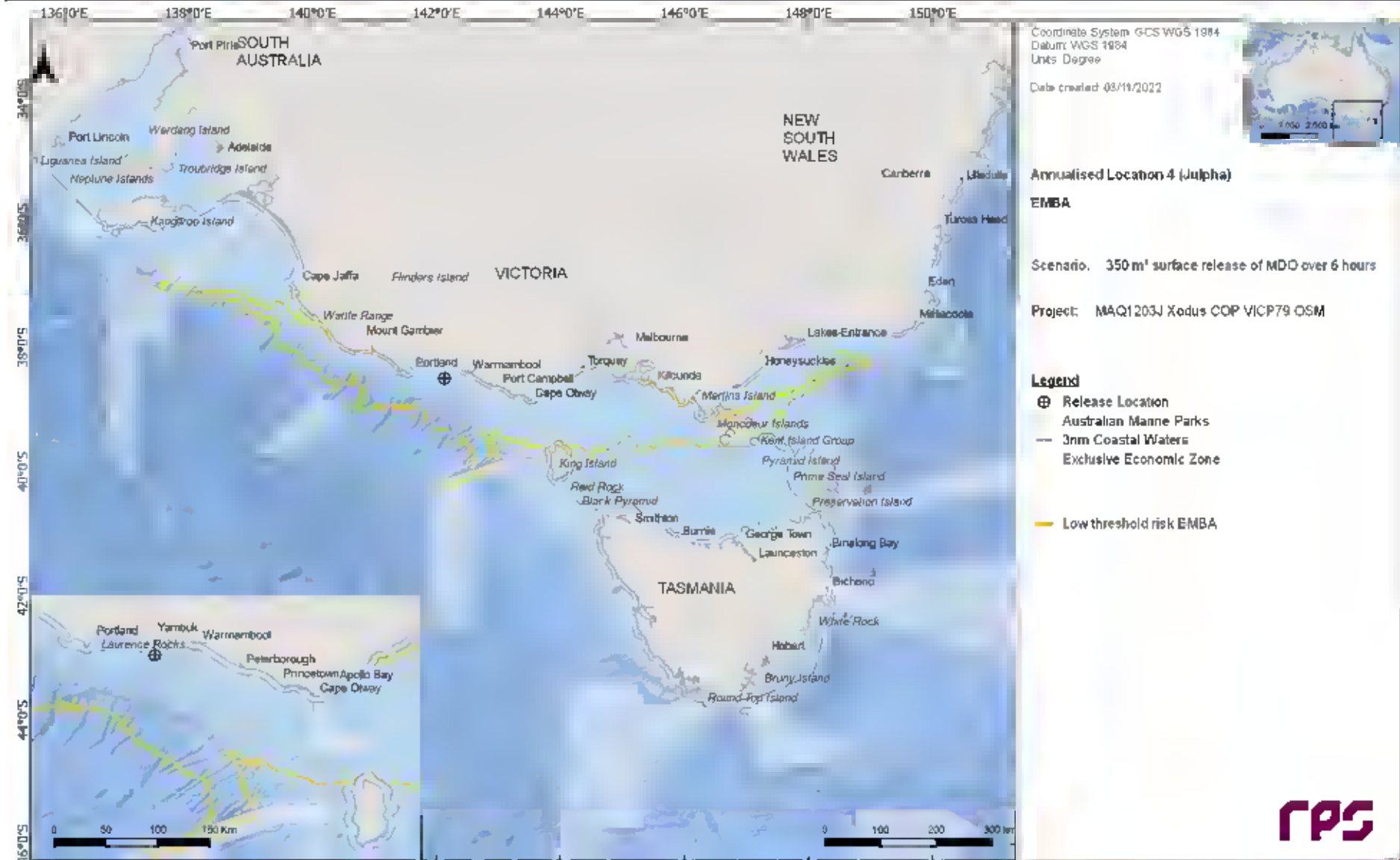


Figure 20.1 Predicted low threshold EMBA from a vessel collision at Location 4. The annualised results were calculated from 200 spill simulations using the 'low' threshold exposure values for each of the modelled oil components.

20.2 Stochastic Analysis

20.2.1 Floating Oil Exposure

Table 20.1 summarises the maximum distances and directions travelled by the floating oil from the release location at each threshold for each season.

Table 20.2 summarises the potential floating oil exposure to individual receptors for each season.

Figure 20.2 to Figure 20.3 illustrate the extent of floating oil exposure for each season.

The simulation that resulted in the largest swept area of floating oil exposure at or above the low threshold during winter and summer was 187.0 km² and 151.4 km², respectively.

Table 20.1 Maximum distances and directions travelled by floating oil from a vessel collision at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential floating oil exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	49.4	17.1	5.7
	Maximum distance (km) from release location (99 th percentile)	39.8	16.1	5.7
	Direction	E	E	E
Winter	Maximum distance (km) from release location	62.3	20.7	3.0
	Maximum distance (km) from release location (99 th percentile)	42.9	19.6	3.0
	Direction	E	ESE	SSW

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Table 20.2 Summary of the potential exposure by floating oil to individual receptors from a vessel collision at Location 4 for each season. Results were calculated from 100 spill simulations per season.

Receptor		Summer						Winter					
		Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)			Probability of floating oil exposure (%)			Minimum time before floating oil exposure (days)		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
IBRA	Warrnambool Plain	-	-	-	-	-	-	2	-	-	2.21	-	-
IMCRA	Otway	100	100	26	0.04	0.04	0.04	100	100	19	0.04	0.04	0.04
KEF	Bonney Coast Upwelling	35	9	-	0.17	0.21	-	19	4	-	0.21	0.54	-
State Waters	Victoria	20	5	-	0.33	0.5	-	16	-	-	0.54	-	-

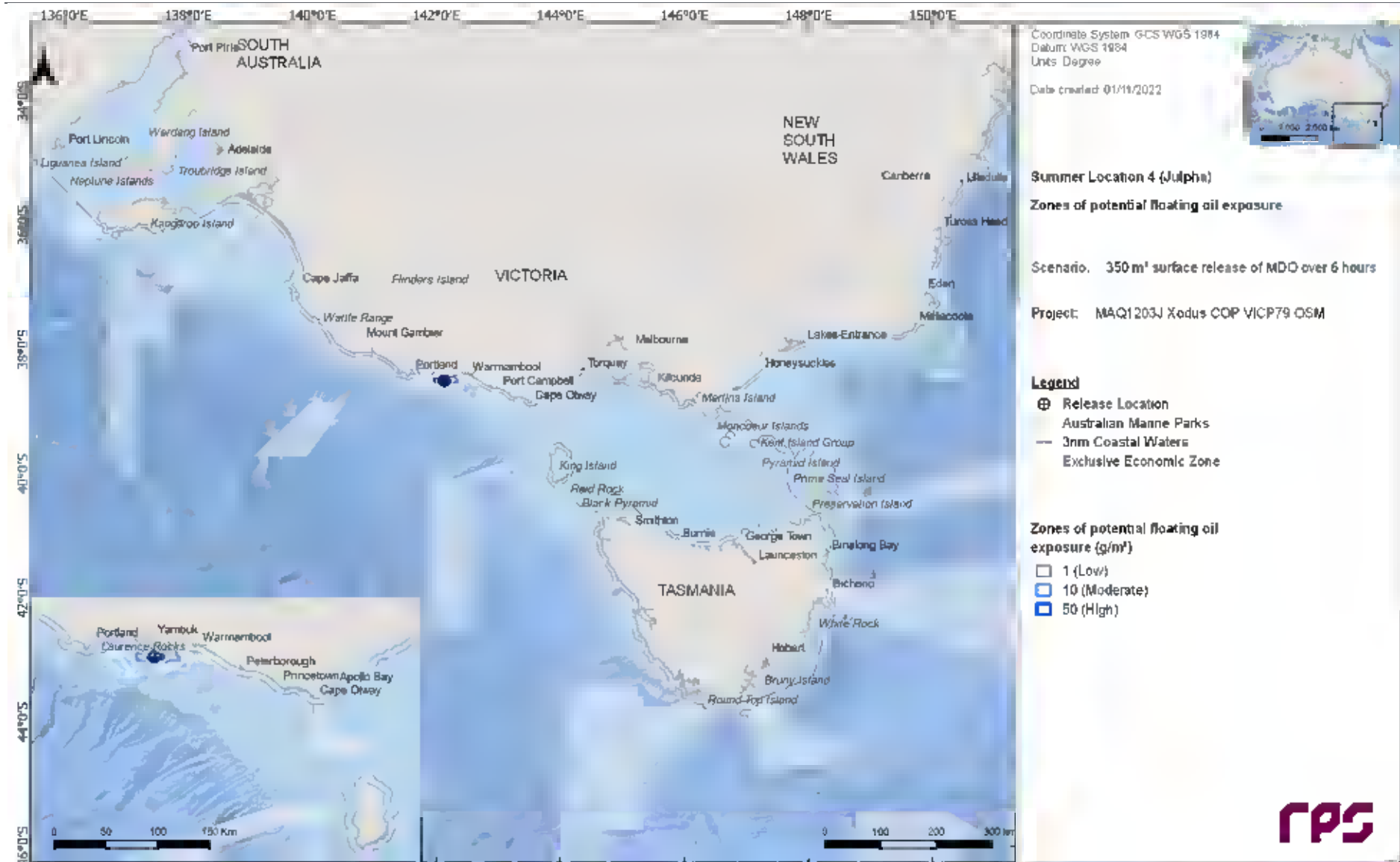


Figure 20.2 Zones of potential floating oil exposure from a vessel collision at Location 4 during summer conditions. The results were calculated from 100 spill simulations.

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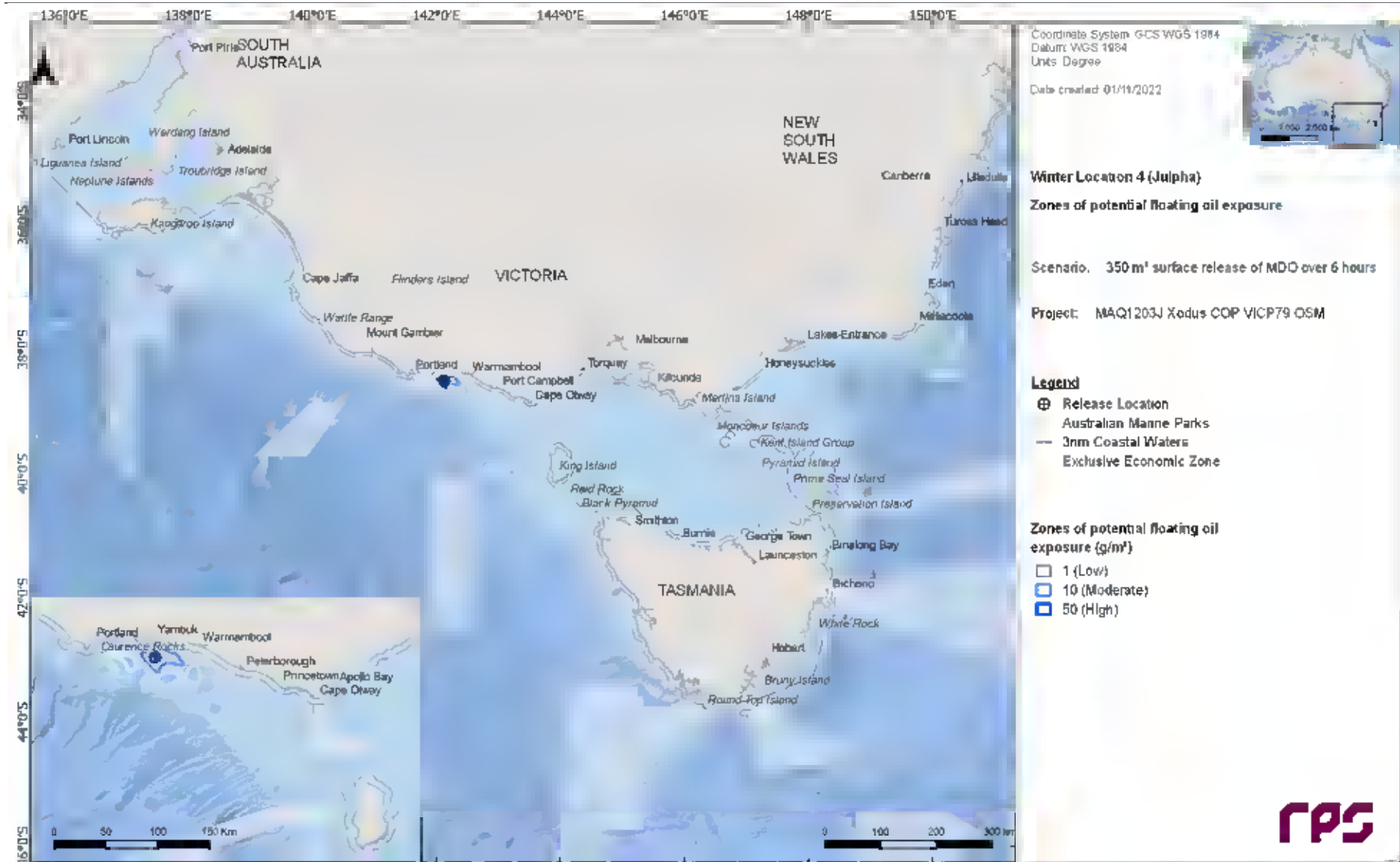


Figure 20.3 Zones of potential floating oil exposure from a vessel collision at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

20.2.2 Shoreline Accumulation

Table 20.3 summarises the predicted oil accumulation on any shoreline during each season.

Table 20.4 and Table 20.5 summarises the oil accumulation on individual shoreline receptors for each season.

The maximum potential shoreline loading for the specified thresholds for each season are presented in Figure 20.4 and Figure 20.5.

Table 20.3 Summary of oil accumulation on any shoreline from a vessel collision at Location 4 during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the low threshold (10 g/m ²)	85	68
Absolute minimum time before oil ashore (days) at or above the low threshold (10 g/m ²)	1.33	1.08
Maximum volume of hydrocarbons ashore (m ³)	34.1	43.0
Average volume of hydrocarbons ashore (m ³)	5.4	9.5
Maximum length of the shoreline at 10 g/m² (km)	21	30
Average shoreline length (km) at 10 g/m² (km)	9.5	11.4
Maximum length of the shoreline at 100 g/m² (km)	11	10
Average shoreline length (km) at 100 g/m² (km)	2.5	4.5
Maximum length of the shoreline at 1,000 g/m² (km)	-	-
Average shoreline length (km) at 1,000 g/m² (km)	-	-

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Table 20.4 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 4 during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)			
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High	
Anser Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bass Coast	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-	-
Colac Otway	3	-	-	9.17	-	-	22	76	< 0.1	4.4	4.1	-	-	8.6	-	-	-
Corangamite	17	1	-	2.75	5.96	-	23	161	0.4	12.2	3.6	3.8	-	14.3	3.8	-	-
Glenelg	22	5	-	2.83	4.58	-	31	398	0.7	10.1	5.3	1.7	-	13.4	2.9	-	-
Kanowna Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-	-
Lady Julia Percy Island	19	3	-	1.54	3.17	-	55	212	0.2	2.5	1	1	-	1	1	-	-
Laurence Rocks	10	-	-	2.08	-	-	17	39	< 0.1	0.7	1.5	-	-	2.9	-	-	-
Mornington Peninsula	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-	-
Moyne	58	23	-	1.33	1.42	-	43	924	3.5	33.8	7.5	2.5	-	19.1	10.5	-	-
Norman Island	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-	-
Skull Rock	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-	-
South Gippsland	1	-	-	21.88	-	-	14	14	1.1	1.1	1.9	-	-	1.9	-	-	-
Surf Coast	-	-	-	-	-	-	-	-	< 0.1	< 0.1	-	-	-	-	-	-	-
Warrnambool	21	4	-	1.33	3.17	-	32	285	0.8	14.8	5.3	2.4	-	16.3	4.8	-	-

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Table 20.5 Summary of oil accumulation on individual shoreline sectors from a vessel collision at Location 4 during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%)			Minimum time before shoreline accumulation (days)			Load on shoreline (g/m ²)		Volume on shoreline (m ³)		Mean length of shoreline accumulation (km)			Maximum length of shoreline accumulation (km)		
	Low	Mod	High	Low	Mod	High	Mean	Peak	Mean	Peak	Low	Mod	High	Low	Mod	High
Anser Island	1	-	-	23.25	-	-	14	14	0.2	0.2	1	-	-	1	-	-
Bass Coast	1	-	-	15	-	-	25	35	0.9	0.9	2.9	-	-	2.9	-	-
Colac Otway	21	3	-	3.75	4.46	-	30	490	1.3	32.9	6.7	5.1	-	20.1	9.6	-
Corangamite	35	7	-	1.71	2.46	-	35	376	1.8	14.2	6	3	-	17.2	5.7	-
Glenelg	3	-	-	4.08	-	-	25	71	0.2	7.3	10.2	-	-	20.1	-	-
Kanowna Island	2	-	-	21.13	-	-	21	24	< 0.1	0.3	1	-	-	1	-	-
Lady Julia Percy Island	8	3	-	1.08	1.17	-	123	371	0.2	4.3	1	1	-	1	1	-
Laurence Rocks	2	1	-	3.04	3.42	-	63	177	< 0.1	3.5	2.9	1	-	2.9	1	-
Mornington Peninsula	1	-	-	20.29	-	-	11	11	1.1	1.1	1	-	-	1	-	-
Moyne	36	15	-	1.42	1.71	-	81	859	5.4	43	7.2	4.9	-	19.1	8.6	-
Norman Island	1	-	-	19.58	-	-	26	26	0.7	0.7	2.9	-	-	2.9	-	-
Skull Rock	2	-	-	21.13	-	-	21	24	< 0.1	0.3	1	-	-	1	-	-
South Gippsland	3	-	-	19.67	-	-	13	18	< 0.1	1.2	2.9	-	-	4.8	-	-
Surf Coast	1	-	-	10.79	-	-	13	13	< 0.1	1.9	1.9	-	-	1.9	-	-
Warrnambool	12	3	-	1.42	1.75	-	47	521	0.7	14.4	5.8	2.5	-	14.3	3.8	-

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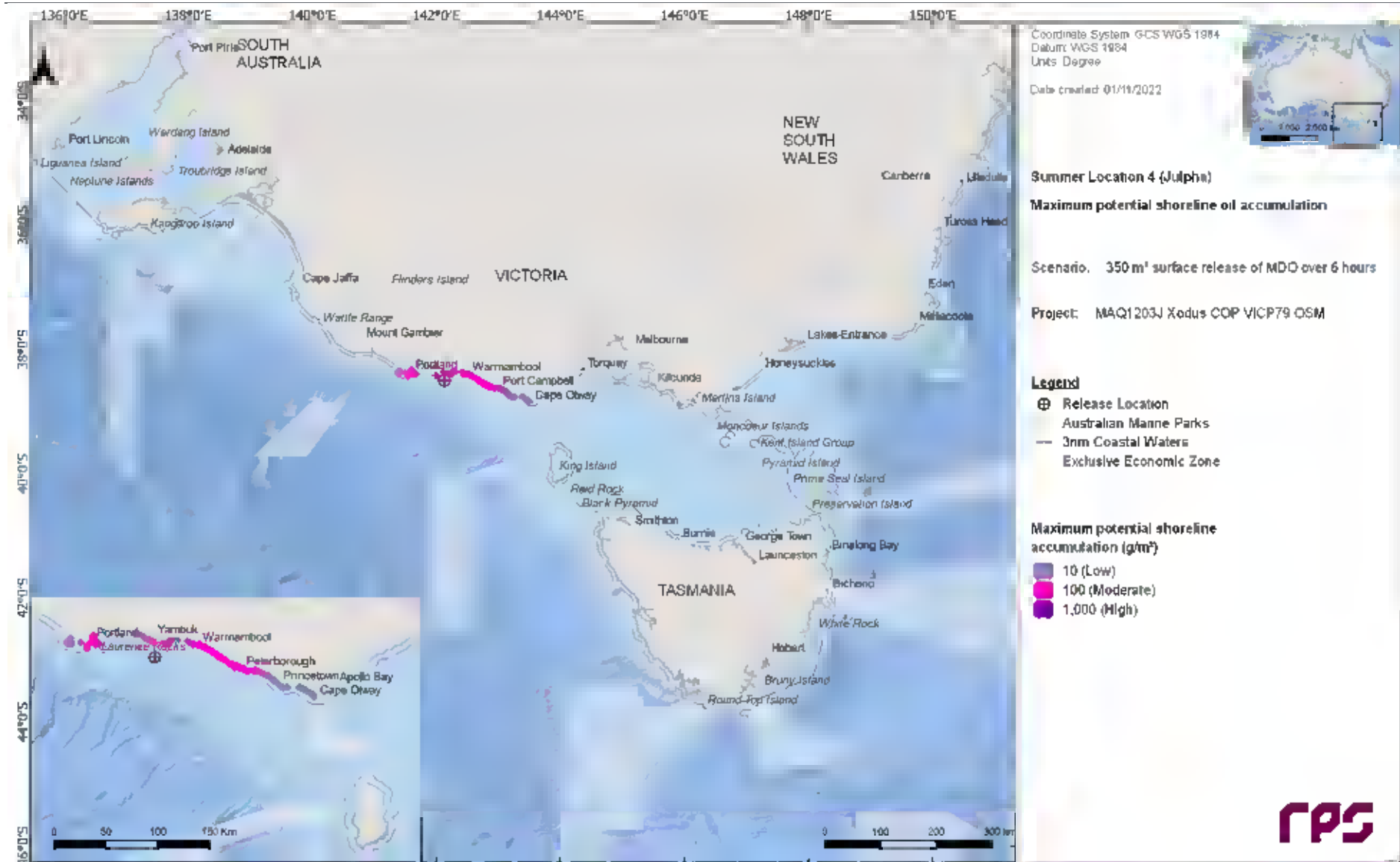


Figure 20.4 Maximum potential shoreline loading from a vessel collision at Location 4 during summer conditions. The results were calculated from 100 spill simulations.

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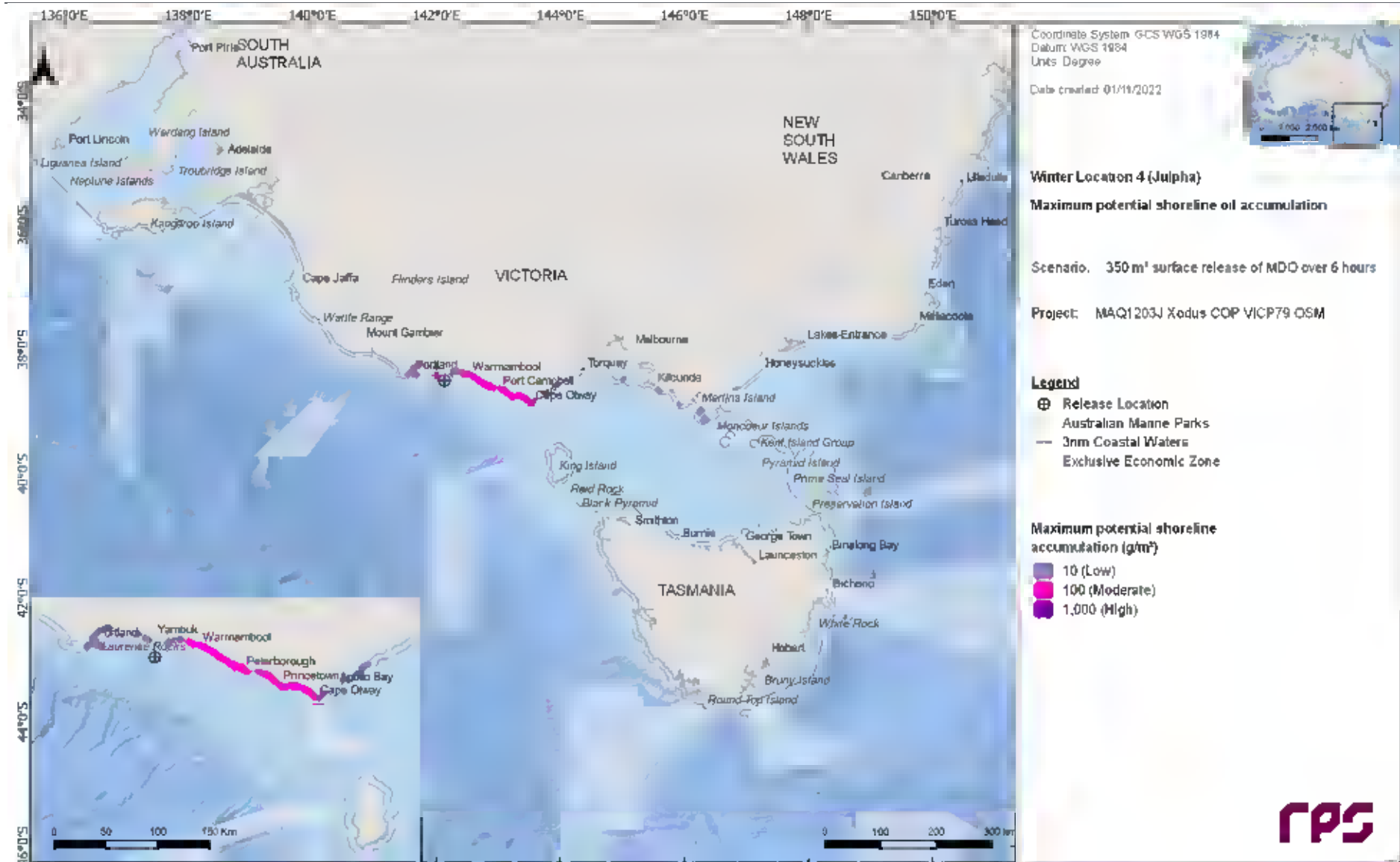


Figure 20.5 Maximum potential shoreline loading from a vessel collision at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

20.2.3 In-water exposure

20.2.3.1 Dissolved Hydrocarbons

Table 20.6 summarises the maximum distances and directions travelled by dissolved hydrocarbons from the release location to each threshold, in the 0 – 10 m depth layer.

Table 20.7 summarises the potential exposure to receptors from dissolved hydrocarbons in the 0 – 10 m for each threshold and season.

Figure 20.6 and Figure 20.7 illustrate the extent of dissolved hydrocarbon exposure during summer and winter, respectively, in the 0-10 m depth layers.

Table 20.6 Maximum distance and direction by dissolved hydrocarbon exposure (0-10 m) from a vessel collision at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential dissolved hydrocarbon exposure		
		Low	Moderate	High
Summer	Maximum distance (km) from release location	66	1	-
	Maximum distance (km) from release location (99 th percentile)	54	1	-
	Direction	W	E	-
Winter	Maximum distance (km) from release location	119	24	-
	Maximum distance (km) from release location (99 th percentile)	89	24	-
	Direction	ESE	E	-

Table 20.7 Probability of dissolved hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer					Winter		
		Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure			Maximum concentration (ppb)	Probability of instantaneous dissolved hydrocarbon exposure		
			Low	Mod erate	High		Low	Mode rate	High rate
IBRA	Warrnambool Plain	17	1	-	-	22	2	-	-
IMCRA	Otway	55	49	1	-	64	43	1	-
KEF	Bonney Coast Upwelling	37	8	-	-	30	5	-	-
MNP	Twelve Apostles	5	-	-	-	12	1	-	-
State Waters	Victoria	27	2	-	-	28	4	-	-

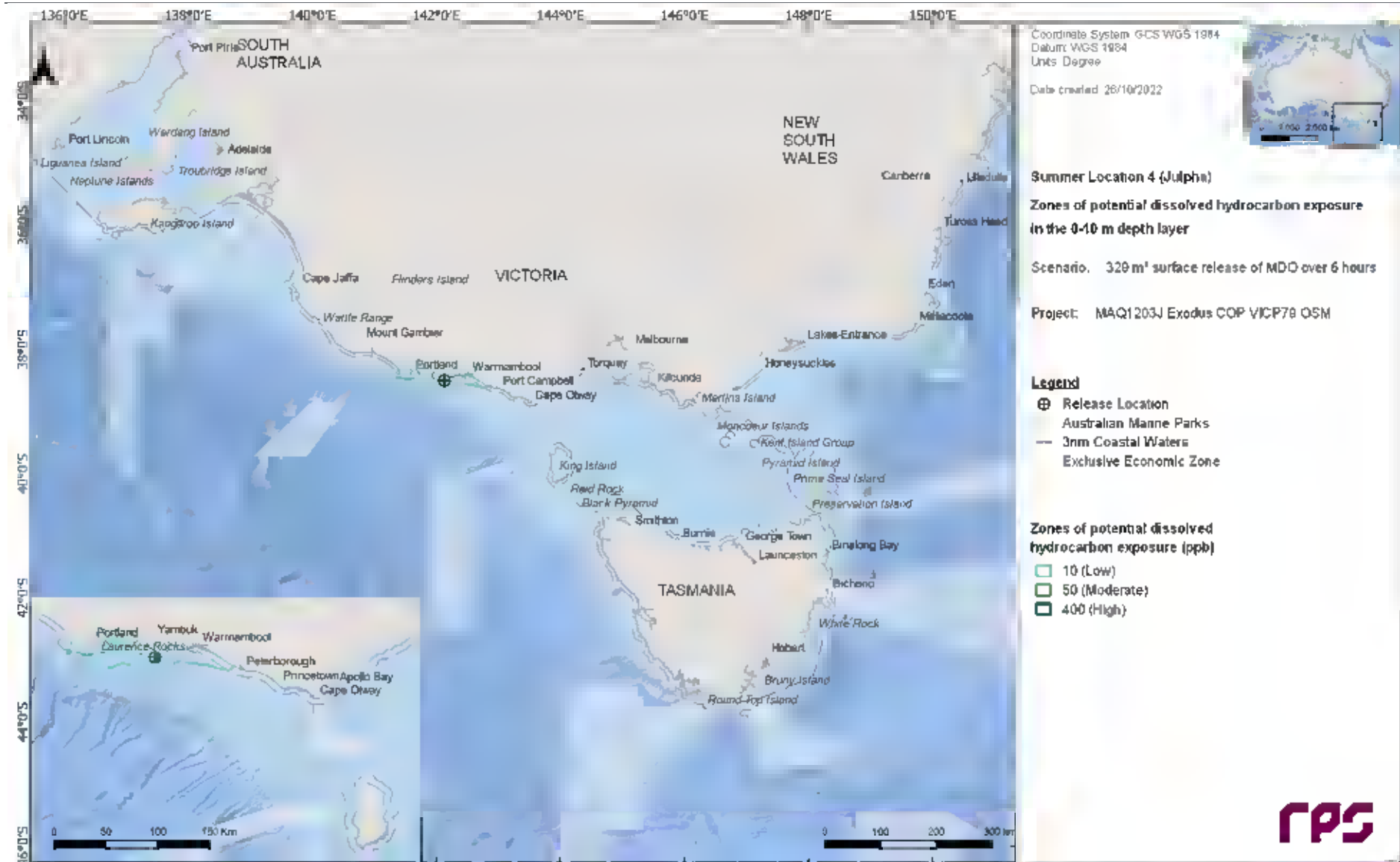


Figure 20.6 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 4 during summer conditions. The results were calculated from 100 spill simulations.

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Figure 20.7 Zones of potential dissolved hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

20.2.3.2 Entrained Hydrocarbons

Table 20.8 summarises the maximum distances and directions travelled by entrained hydrocarbons within the 0-10 m depth layer.

Table 20.9 summarises the potential exposure to receptors from entrained hydrocarbons in the 0-10 m depth layers, for each season.

Figure 20.8 and Figure 20.9 illustrate extent of entrained hydrocarbon exposure for each season in the 0-10 m depth layer.

Table 20.8 Maximum distance and direction by entrained hydrocarbon exposure (0-10 m) from a vessel collision at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Zones of potential entrained hydrocarbon exposure	
		Low	High
Summer	Maximum distance (km) from release location	434	137
	Maximum distance (km) from release location (99 th percentile)	364	125
	Direction	WNW	W
Winter	Maximum distance (km) from release location	598	206
	Maximum distance (km) from release location (99 th percentile)	562	196
	Direction	E	E

Table 20.9 Probability of entrained hydrocarbons exposure to receptors in the 0-10 m depth layer from a vessel collision at Location 4 for each threshold and season. Results were calculated from 100 spill simulations per season.

Receptor		Summer			Winter		
		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure		Maximum concentration (ppb)	Probability of instantaneous entrained hydrocarbon exposure	
			Low	High		Low	High
AMP	Apollo	46	5	-	212	43	3
	Beagle	-	-	-	26	6	-
	Murray	12	1	-	-	-	-
	Zeehan	14	1	-	-	-	-
IBRA	Bridgewater	225	20	3	74	4	-
	Flinders	-	-	-	26	2	-
	Gippsland Plain	10	1	-	26	3	-
	Glenelg Plain	254	28	7	162	6	1
	Otway Plain	82	8	-	204	47	4
	Otway Ranges	71	10	-	145	56	3
	Warrnambool Plain	710	50	16	711	59	20
	Wilsons Promontory	7	-	-	28	7	-
IMCRA	Central Bass Strait	36	3	-	210	31	5
	Central Victoria	46	4	-	171	38	3
	Coorong	16	1	-	-	-	-
	Flinders	7	-	-	29	7	-
	Otway	5,773	99	94	4,730	96	90
	Twofold Shelf	-	-	-	26	5	-
	Victorian Embayments	6	-	-	24	1	-
KEF	Bonney Coast Upwelling	2,194	63	44	1,848	28	20
	Upwelling East of Eden	-	-	-	14	2	-
	West Tasmania Canyons	26	1	-	15	1	-
MNP	Bunurong	8	-	-	12	2	-
	Discovery Bay	64	13	-	19	1	-
	Port Phillip Heads	-	-	-	18	1	-
	Twelve Apostles	114	20	1	405	60	13
	Wilsons Promontory	4	-	-	23	7	-
MP	Lower South East	13	1	-	-	-	-
MS	Marengo Reefs	11	1	-	28	4	-
	Merri	273	36	2	201	12	2
	The Arches	165	20	1	134	40	3
Nearshore Waters	Anser Island	1	-	-	17	6	-
	Bass Coast	9	-	-	17	1	-
	Colac Otway	82	9	-	204	52	4
	Corangamite	322	32	3	292	58	16
	Curtis Island	-	-	-	17	1	-
	Glenelg	254	28	7	162	6	1
	Glennie Group	4	-	-	16	6	-

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	Grant	13	1	-	-	-	-
	Greater Geelong	1	-	-	11	1	-
	Hogan Island Group	-	-	-	26	2	-
	Kanowna Island	1	-	-	19	7	-
	Lady Julia Percy Island	1,004	47	21	345	10	5
	Laurence Rocks	377	33	9	193	6	2
	Moncoeur Islands	-	-	-	28	7	-
	Mornington Peninsula	2	-	-	26	1	-
	Moyne	710	50	16	711	50	20
	Mud Island	-	-	-	12	1	-
	Norman Island	7	-	-	14	3	-
	Phillip Island	8	-	-	17	3	-
	Rodondo Island	-	-	-	25	6	-
	Shellback Island	7	-	-	12	1	-
	Skull Rock	1	-	-	20	7	-
	South Gippsland	10	1	-	15	5	-
	Surf Coast	2	-	-	16	1	-
	Warrnambool	637	48	11	588	22	7
NPS4	Bunurong Marine Park	8	-	-	15	1	-
	Wilson's Promontory Marine Park	7	-	-	13	1	-
	Wilson's Promontory Marine Reserve	4	-	-	16	5	-
Ramsar	Glenside Estuary and Discovery Bay Wetlands	24	4	-	1	-	-
RSB	Bravenes Rock	53	9	-	177	51	3
	Cody Bank	3	-	-	13	3	-
	Cutter Rock	-	-	-	16	2	-
	Cody Bank	39	27	-	41	30	-
	Cutter Rock	45	32	-	53	66	-
	Endeavour Reef	32	14	-	32	57	-
	New Zealand Star Bank	16	8	-	29	34	-
	Wakitipu Rock	27	15	-	34	62	-
	Warrego Rock	20	7	-	35	49	-
Wright Rock	38	13	-	30	63	-	
State Waters	South Australia	21	2	-	-	-	-
	Tasmania	-	-	-	26	5	-
	Victoria	1,474	60	29	1,227	65	27

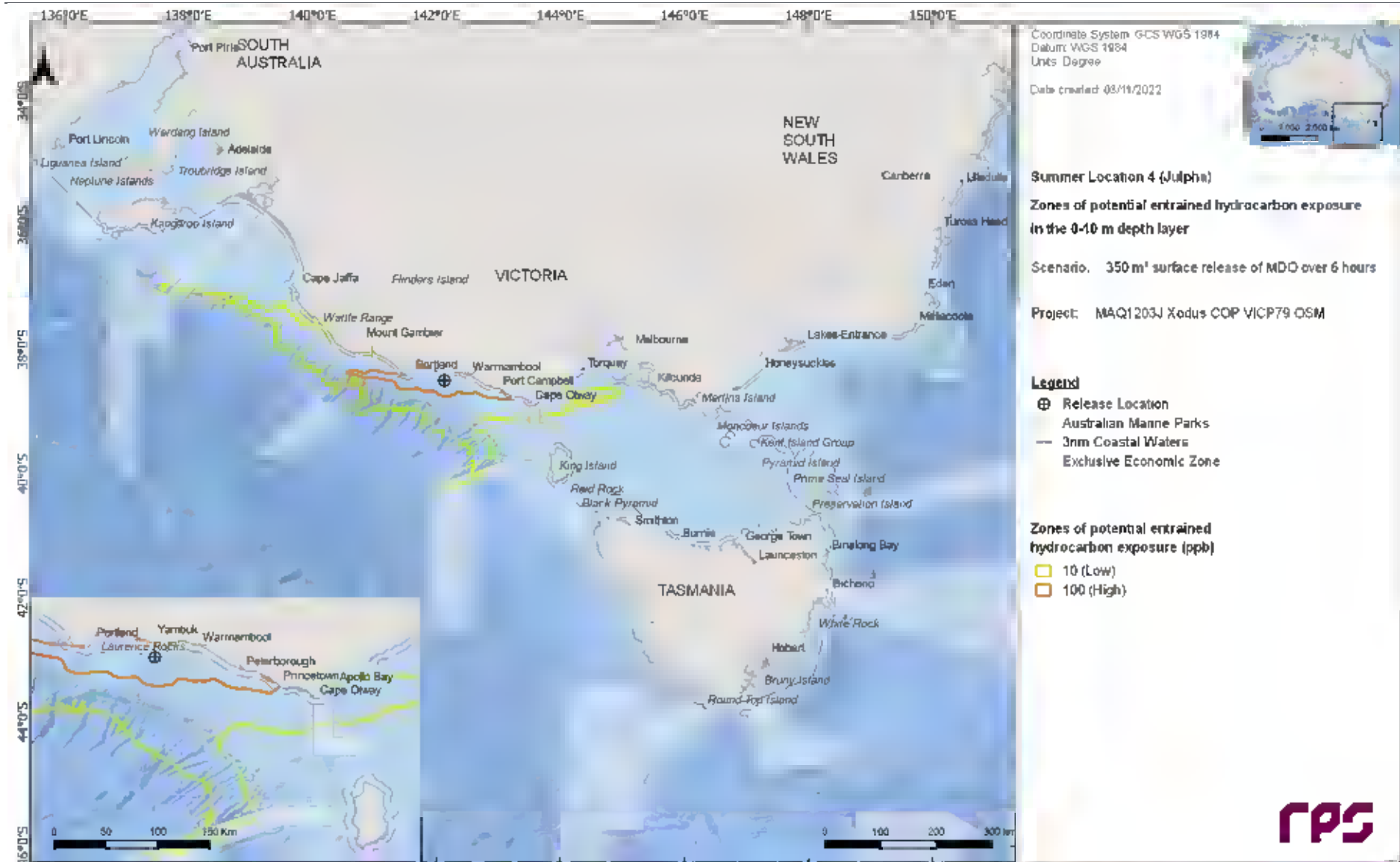


Figure 20.8 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 4 during summer conditions. The results were calculated from 100 spill simulations.



Figure 20.9 Zones of potential entrained hydrocarbon exposure at 0-10 m below the sea surface from a vessel collision at Location 4 during winter conditions. The results were calculated from 100 spill simulations.

20.3 Deterministic Analysis

20.3.1 Largest Volume of Hydrocarbons Ashore

The simulation that resulted in the largest volume of hydrocarbons ashore was identified as run number 94 and commenced during winter conditions, 1 pm 1st August 2015.

Figure 20.10 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 2.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 20.11 and Figure 20.12, respectively.

Figure 20.13 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 155 m³ (~44%) was lost to the atmosphere through evaporation. Approximately, 100 m³ (~29%) of the released volume decayed, while approximately 60 m³ (~17%) was predicted to remain within the water column and approximately 35 m³ (~10%) was present on the shorelines.

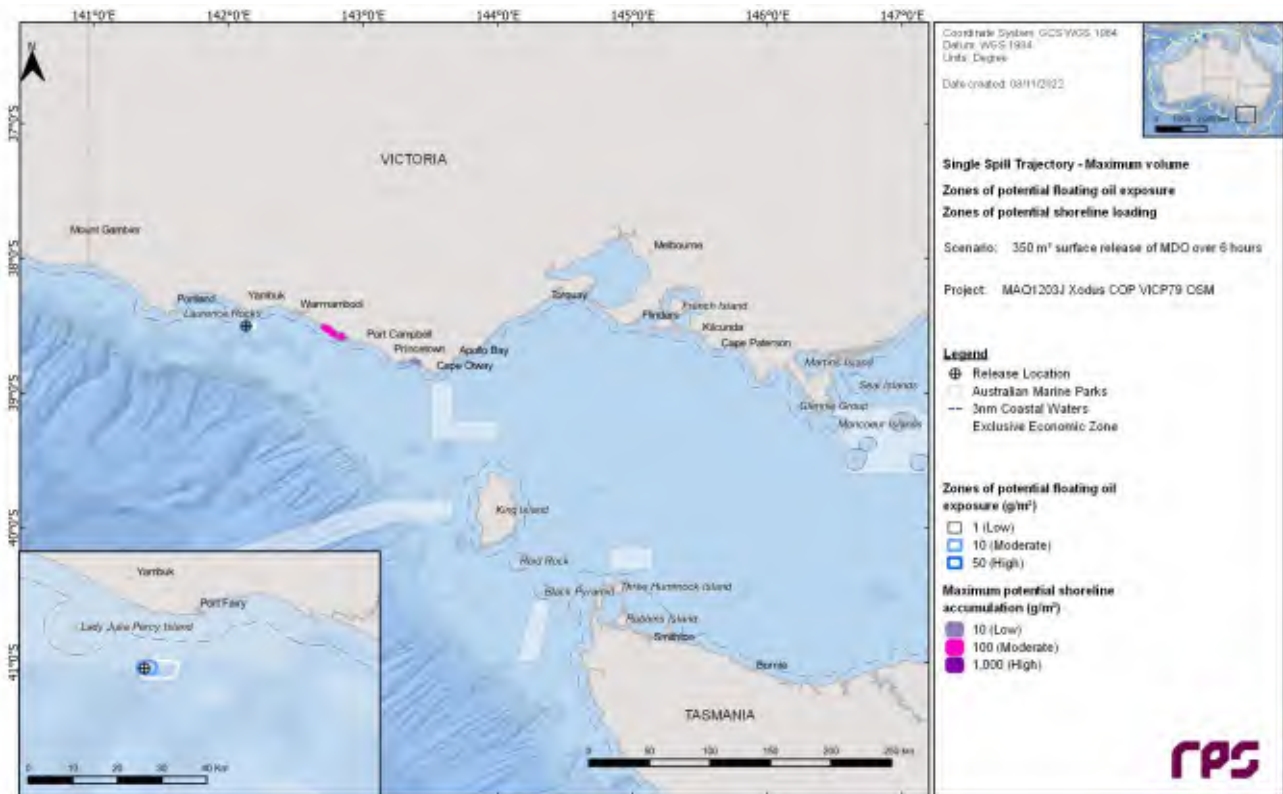


Figure 20.10 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 4.

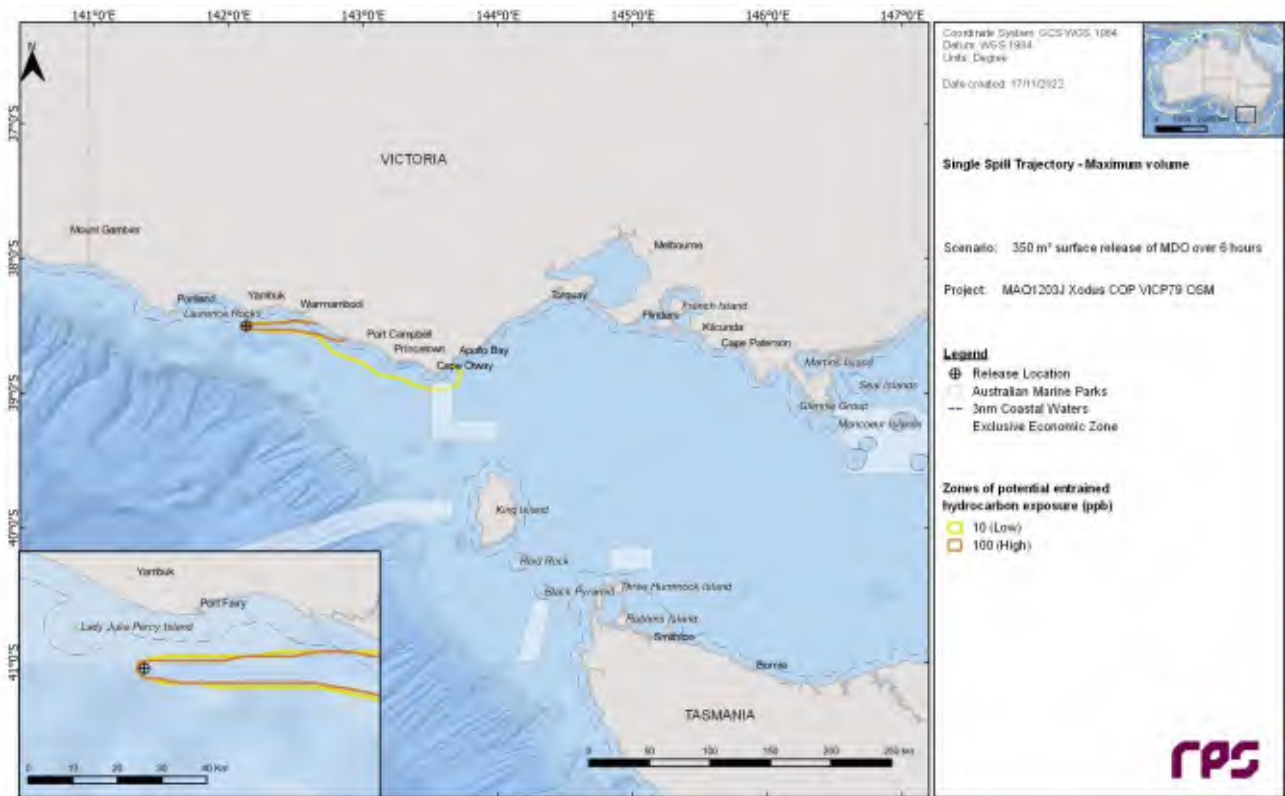


Figure 20.11 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 4.

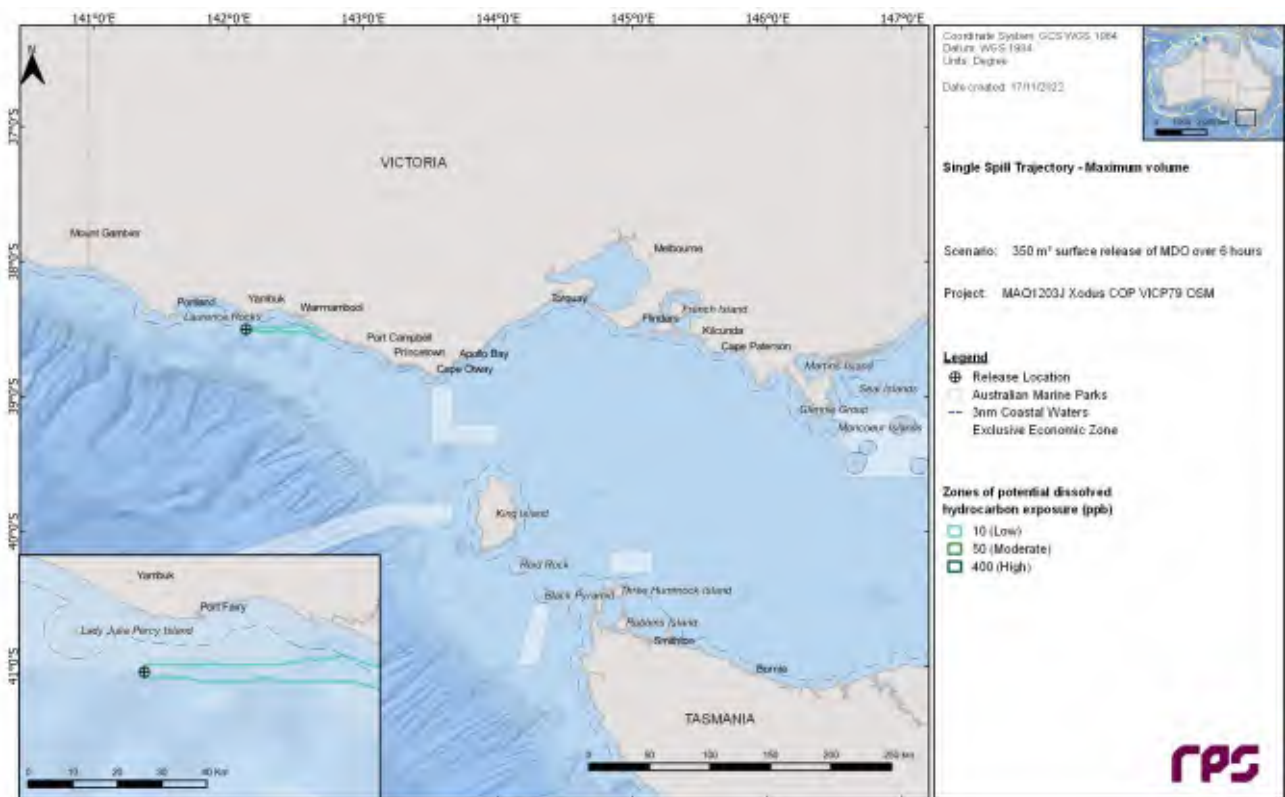


Figure 20.12 Predicted extent of the dissolved hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 4.

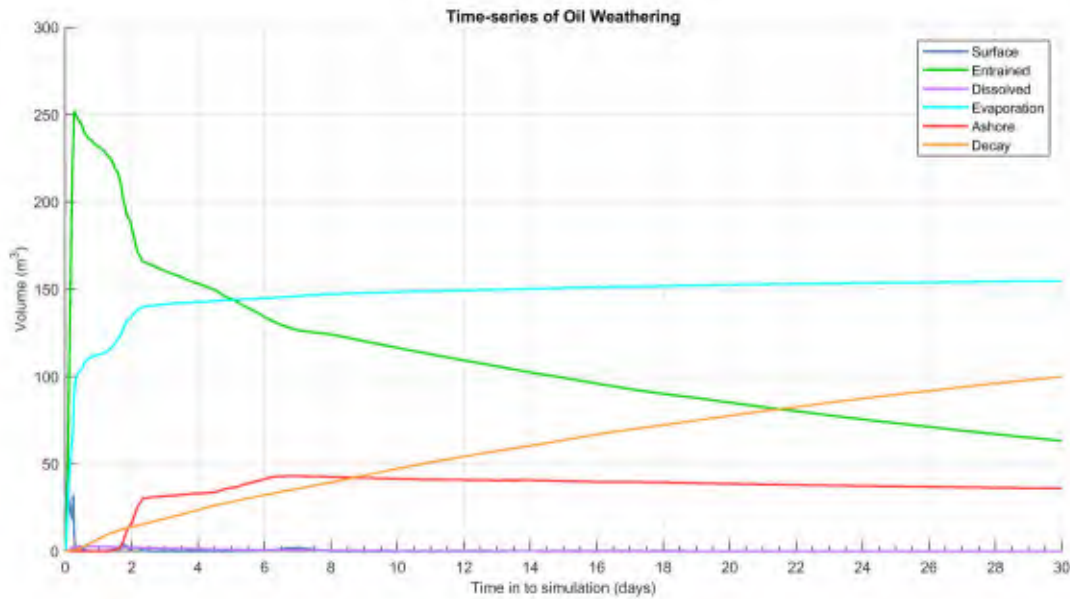


Figure 20.13 Predicted weathering and fates for the simulation that led to the largest volume of hydrocarbons ashore from a vessel collision at Location 4.

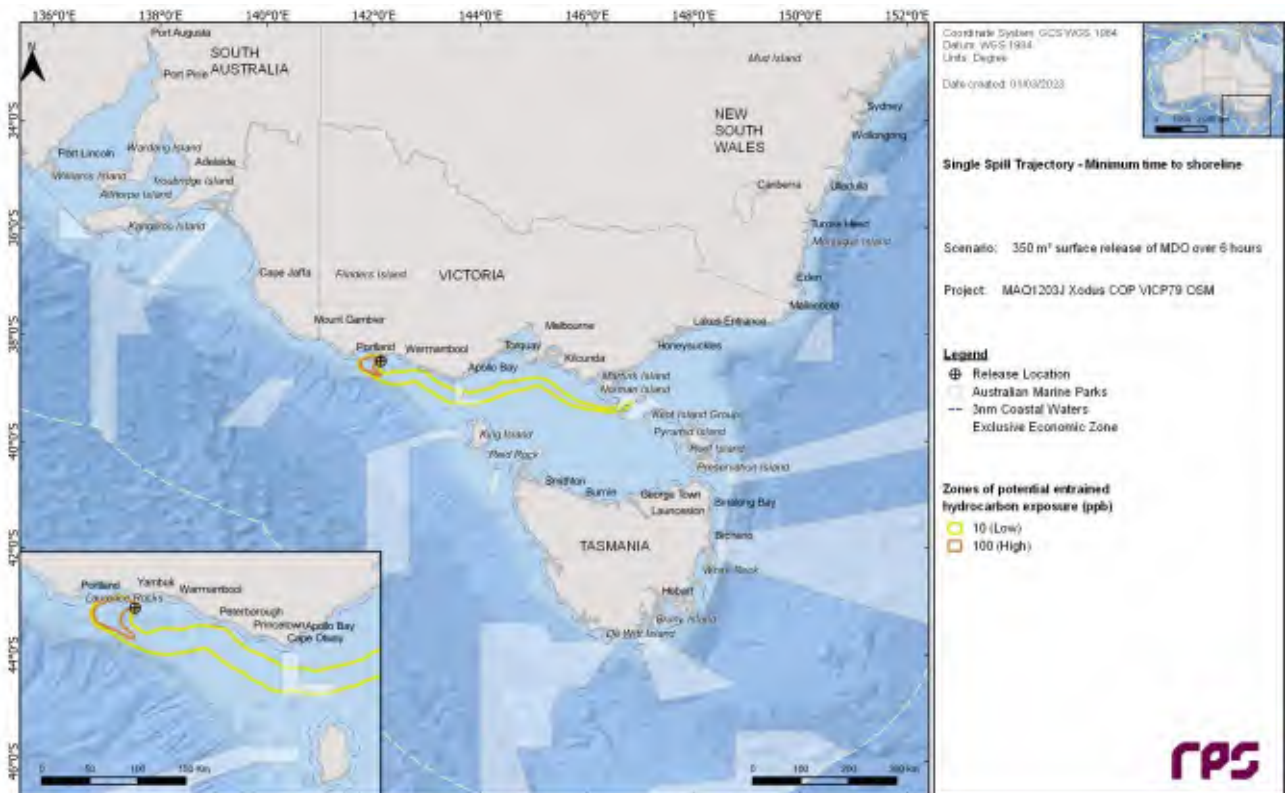
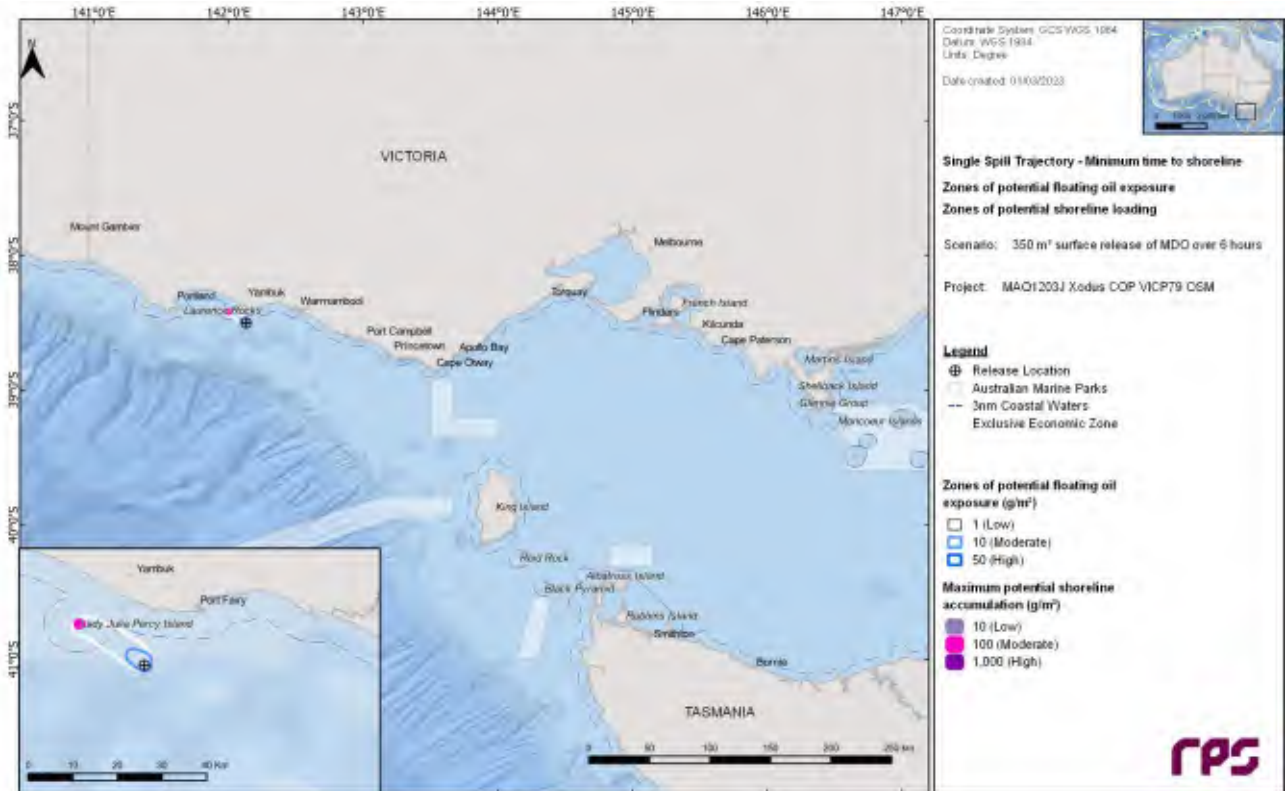
20.3.2 Minimum time to Shoreline Accumulation

The simulation that resulted in the minimum time to hydrocarbons ashore of 1.08 days was identified as run number 11 which commenced during winter conditions, 6 am 7th June 2014.

Figure 20.14 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days).

The extent of the predicted entrained hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation are presented in Figure 20.15. No dissolved hydrocarbon exposure was predicted above the low threshold.

Figure 20.16 presents the fates and weathering graph for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 155 m³ (~45%) was lost to the atmosphere through evaporation. Approximately, 110 m³ (~32%) of the released volume decayed, while approximately 80 m³ (~23%) was predicted to remain within the water column and approximately 3 m³ (~1%) remained on shorelines.



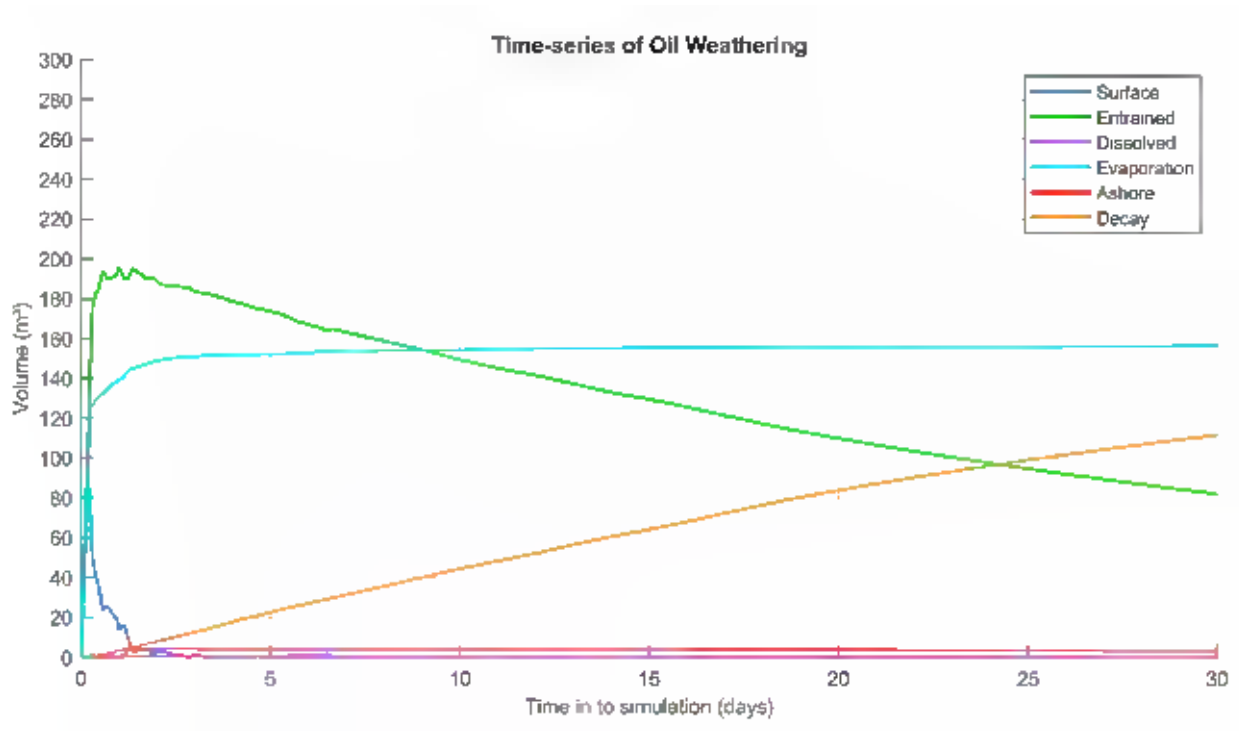


Figure 20.16 Predicted weathering and fates for the simulation that led to the minimum time to shoreline accumulation from a vessel collision at Location 4.

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MEMO

Date: 04 June 2024
To: [REDACTED]
From: [REDACTED]
Pages: 2 inc. this page
Regarding: Representativeness of Subsea Near-field Modelling for water depths up to 200m

Representativeness of Subsea Near-field Modelling for a Loss of Well Control Scenario in Water Depths up to 200 m

Loss of well control (LOWC) modelling was previously conducted for a range of potential drilling areas in the Otway Basin to account for proximity to shorelines and varying met-ocean conditions and water depths across the potential activity region. The modelled locations ranged in water depths from 45 to 114 m below sea level. Modelling assessed the potential risk of exposure to the surrounding waters and shorelines under seasonal conditions. This approach assisted with identifying the environmental values and sensitive regions/receptors that would be at risk of exposure on a seasonal basis, given the dominant winds and water currents that vary among the seasons.

To define the near-field plume dynamics, the subsea blowout model, OILMAP-DEEP, was applied. The model simulates the plume rise dynamics in two phases, the initial jet phase and the buoyant plume phase. The initial jet phase governs the plume dynamics directly above the subsurface release location and is predominately driven by the exit velocity. During this phase, the hydrocarbon droplet size and distribution is calculated. Next, the rise dynamics are dominated by the buoyant nature of the plume until the termination of the plume phase (known as the trapping depth). At this point, the results from OILMAP-DEEP (including plume trapping depth, plume diameter and droplet size distribution) are integrated into the far-field model SIMAP to simulate the rise and dispersion of the condensate droplets.

Due to the significant estimated volume of gas during the subsea LOWC scenario, the modelled results for water depths of 45 m to 114 m are found to be representative of depths up to 150 m. RPS performed additional near-field subsea modelling at 200 m. The modelling identified the plume is predicted to breach the surface waters (see Figure 1), which is in line with the shallow water release sites, hence, confirming that the results can be extended to a depth of up to 200 m. Additional modelling would be required to account for depths greater than 200 m

MEMO

Date: 04 June 2024

Regarding: Representativeness of Subsea Near-field Modelling for water depths up to 200m

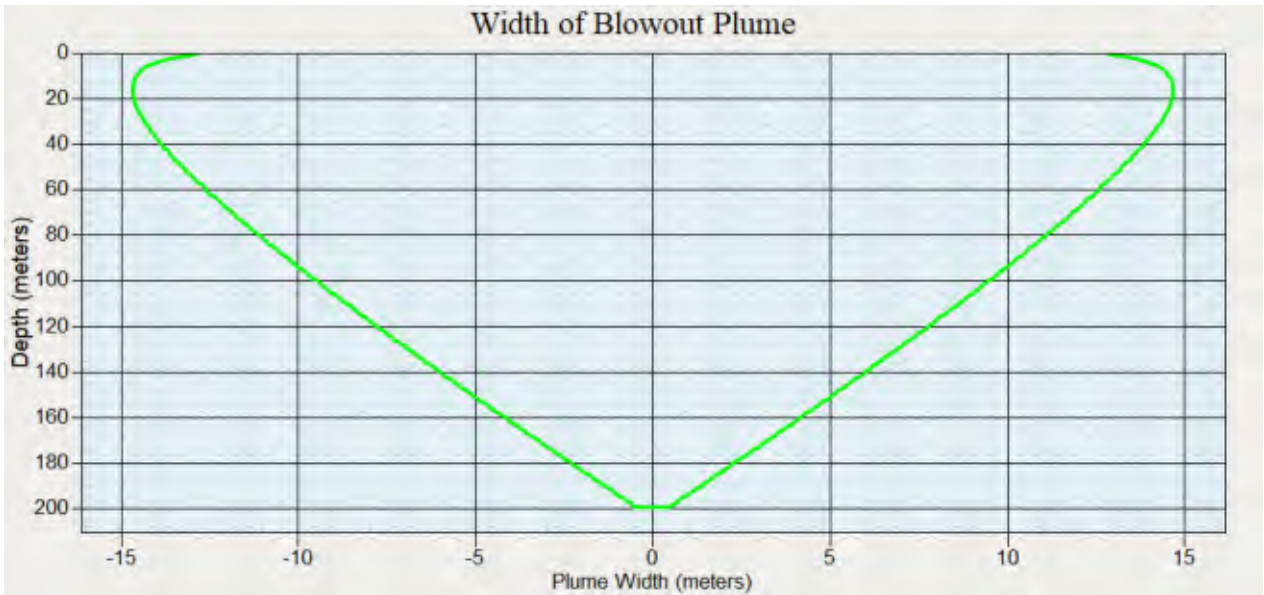


Figure 1 Plot of the predicted near-field plume during the subsea LOWC scenario at 200 m water depth, which was predicted to breach of the surface waters.

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APPENDIX F LIGHT MODELLING REPORTS



ConocoPhillips Australia

VIC/P79 Otway Drilling Campaign

Light Modelling Study for VIC/P79 North

ASSIGNMENT P100273-S04
DOCUMENT P-100273-S04-A-REPT-001



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D	25/06/2024	ISSUED FOR REVIEW	■	■	■	■
C	30/08/2023	ISSUED FOR REVIEW	■	■	■	■
B	21/12/2022	ISSUED FOR REVIEW	■	■	■	■
A	8/12/2022	ISSUED FOR REVIEW	■	■	■	■

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EXECUTIVE SUMMARY

This technical report presents the results of the visible line of sight and light intensity (illuminance) assessments for ConocoPhillips Australia's (ConocoPhillips) Otway Exploration Drilling Campaign (Exploration Campaign). This light modelling study was conducted for the Exploration Campaign within the northern part of petroleum title VIC/P79 (VIC/P79N). The sources of light emissions considered were the lights and flare from the mobile offshore drilling unit (MODU). The lights on the MODU facility include the working lights on the deck and the navigation lights on the derrick. The light that comes from the flaring during well testing was assumed to have the same height as the helicopter deck and was considered at a maximum flare rate of 40 MMscfd.

The threshold for the spatial extent of visible light that is predicted to occur from the Exploration Campaign was defined as whether any part of the facility is visible as a dot on the horizon (visible line of sight assessment). The threshold for the spatial extent of a measurable change in ambient light that is predicted to occur from the Exploration Campaign was defined as an illuminance equivalent to ambient light on a moonless clear night sky/new moon (<0.001 lux). The area within these thresholds is considered relevant to the impact assessment for planned light emissions from the Exploration Campaign.

The results of visible line of sight assessment conclude that the MODU lights and flare will be visible from a distance of 38 km from receptors at sea level. Due to the elevation of viewpoints on the mainland, the MODU may be visible from the Victorian mainland adjacent to the project area.

Light intensity (illuminance) assessment indicates that during flaring, a measurable change will occur up to 49 km from the expected position of the MODU and reduces to 9 km from the MODU when not flaring.

At the selected receptor locations of Mepunga Coastal Reserve (21 km), Yambuk Nature Conservation Reserve (24 km), Yambuk Coastal Reserve (28 km), Discovery Bay Marine National Park (45 km), Twelve Apostles Marine National Park (50 km), and the nearby towns, the light intensity levels are comparable to the ambient light levels less than a quarter moon (<0.01 lux) when flaring, and less than a moonless clear night sky (<0.001 lux) when not flaring. A Zone of Theoretical Visibility analysis is thus recommended to quantify the visual impact and provide a communication tool to the relevant stakeholders.



1 INTRODUCTION

1.1 Project Overview

The Otway Exploration Drilling Campaign is located adjacent to the largest gas fields in the offshore Otway Basin, Thylacine and Geographe. ConocoPhillips Australia (ConocoPhillips) plan to execute an exploration well drilling campaign within the northern part of VIC/P79 (denoted as VIC/P79N), as shown in Figure 1-1. This report presents the light modelling study for the Exploration Campaign within VIC/P79N.

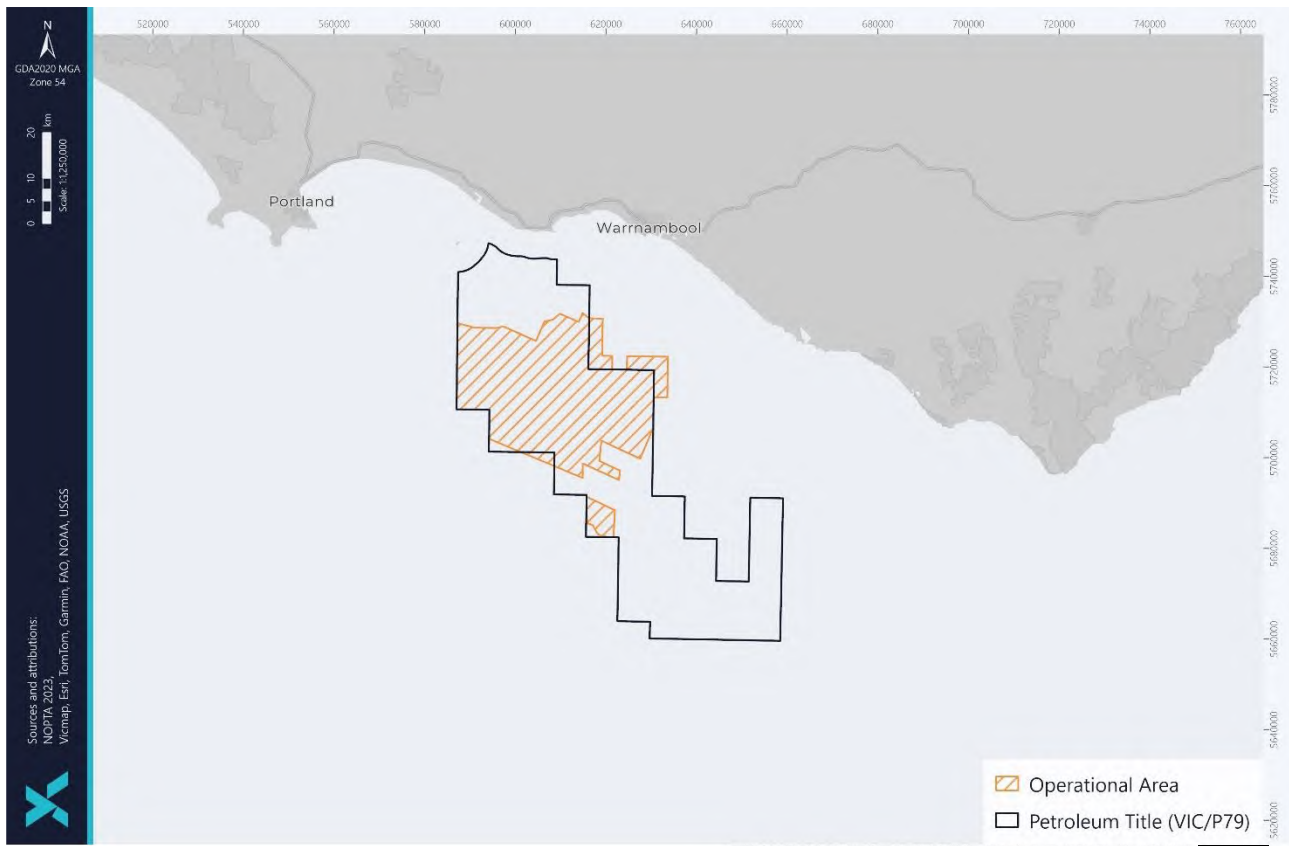


Figure 1-1: Otway drilling light modelling scope for VIC/P79N.

1.2 Aim and Objectives

The purpose of this technical report is to present the assessment undertaken to estimate the artificial light emissions from the Exploration Campaign within VIC/P79N to inform environmental impact assessment and management planning of the Exploration Campaign. This study considered and assessed:

- the distances of receptors from the mobile offshore drilling unit (MODU),
- light sources and flaring from the MODU, and
- the light levels received at various receptor locations from facility lighting and well test flaring.



1.3 Scope

The sources of light emissions include:

- external facility lighting on MODU and vessels for safe navigation and working conditions, and
- flaring of excess associated gas which will be from a horizontal boom flare and will occur up to approximately 100 hours per well.

Both sources of light emissions are quantified and discussed in this technical report. The exact well locations are yet to be determined. Therefore, all potential locations in VIC/P79N were considered for modelling (Figure 1-1).

The assessment included two sets of modelling:

- visible line of sight estimates, and
- light intensity (illuminance) modelling.

Line of sight estimates have been used as an indication of the distance that the facility and its lights may be visible while light intensity (illuminance) modelling has been used as an indication of the measurable change in ambient light conditions. These quantifications have been used to develop two types of area used for subsequent environmental impact analysis (Table 1-1).

Table 1-1: Predicted artificial light exposure and impact areas for the Exploration Campaign.

ARTIFICIAL LIGHT ASSESSMENT AREAS	DESCRIPTION
Visible Light Exposure Area	The spatial extent of visible light that is predicted to occur from the Exploration Campaign. The threshold for this area is whether any part of the facility is visible as a dot on the horizon.
Potential Impact Area	The spatial extent of a measurable change in ambient light that is predicted to occur from the Exploration Campaign. The threshold for this area is an illuminance equivalent to ambient light on a moonless clear night sky/new moon (<0.001 lux). This is the area relevant to the impact assessment for planned light emissions from the Exploration Campaign.

The modelling utilises the MODU as the basis for modelling as it will be the largest and tallest piece of infrastructure that will be infield for the Exploration Campaign. The light intensity modelling utilises the two major sources of light emissions as the basis for the model – the MODU lighting and flaring from the MODU for well testing. Artificial light emissions from vessels (e.g., support vessels) associated with the Exploration Campaign were not included in the assessment due to their much smaller scale and/or temporary and transient nature.



2 BASSIS OF LIGHT ASSESSMENT

2.1 Light and its Measurement

Light is a form of energy that is emitted over a particular band of frequencies and wavelengths of the electromagnetic spectrum, and includes ultraviolet, visible (to humans) light and infrared light. As illustrated in Figure 2-1, the visible range for humans is approximately 400–700 nm. Fauna perceive light differently to humans, and their visible spectrum can vary between ~300 nm and >700 nm depending on the species (Commonwealth of Australia, 2023).

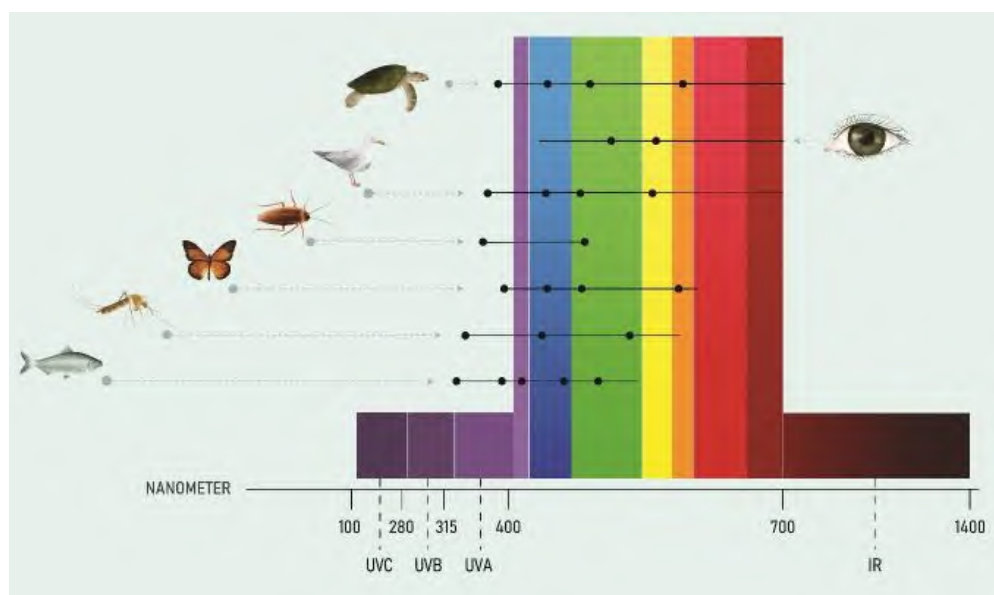


Figure 2-1: Ability to perceive different wavelengths of light in humans and wildlife is shown by horizontal lines. Black dots represent reported peak sensitivity. Note the common sensitivity to short wavelength light across all wildlife (Campos, 2017; Commonwealth of Australia, 2023).

Humans and fauna use photoreceptor cells (cones and rods) in the eye to detect light. Photopic vision, which occurs in bright conditions, activates the cones and allow the eye to see colour. Scotopic vision, which occurs in low light conditions, activates rods and allow the eye to see in shades of grey. Scotopic vision is more sensitive to shorter wavelength light than photopic visions (Commonwealth of Australia, 2023). Nocturnal species rely on scotopic vision and can therefore be sensitive to changes in light at high-energy, short-wavelength end of the spectrum (e.g., ultraviolet, violet and blue light).

Radiometry is the detection and measurement of electromagnetic radiation. With respect to optics, radiometry refers to the detection and measurement of radiant energy within the light (ultraviolet, violet, infrared) portion of the electromagnetic spectrum. Photometry is a subset of radiometry that applies to the visible light spectrum and measured values are also weighted to the typical response of a human eye. As humans and fauna perceive light differently, radiometric measurements are more biologically relevant, as they account for the energy emitted across all light wavelengths (Commonwealth of Australia, 2023). Common quantities used to describe light in radiometric and photometric terms are provided in Table 2-1.



Table 2-1: Typical radiometric and photometric quantities.

RADIOMETRIC			PHOTOMETRIC		
Quantity	Symbol	Units	Quantity	Symbol	Units
Radiant power	Φ_E	W	Luminous flux	Φ_V	lm
Radiant intensity	I_E	W/sr	Luminous intensity	I_V	lm/sr (or cd)
Irradiance	E_E	W/m ²	Illuminance	E_V	lm/m ² (or lux)
Radiance	L_E	W/m ² sr	Luminance	L_V	lm/m ² sr

E = energetic; V = visual; W = watt; sr = steradian; lm = lumen; cd = candela

The conversion between radiometric and photometric units is dependent on the photopic spectral luminous efficiency function, $V(\lambda)$, as defined by the Commission Internationale de l'Eclairage (CIE) in 1924, and the spectral radiant power curve, $\Phi_E(\lambda)$, of the light source. The conversion is provided by the following relationship:

$$\Phi_V = K_m \int_{\lambda=380}^{\lambda=830} \Phi_E(\lambda) V(\lambda) \delta\lambda$$

Where:

- Φ_V is the luminous flux (lumens),
- K_m is a scaling factor equivalent to 683 lm/W,
- $\Phi_E(\lambda)$ is the spectral radiant power (W/nm), and
- $V(\lambda)$ is the photopic spectral luminous efficiency function.

The photopic spectral luminous efficiency function, $V(\lambda)$, is a function of wavelength and relates to how a human eye responds to that wavelength of light. In humans the photoreceptor cells are more responsive to green/yellow wavelength light compared to red or violet. $V(\lambda)$ can be approximated by the following non-linear regression:

$$V(\lambda) = 1.019e^{-285.4(\lambda-0.559)^2}$$

Empirical data shows that the function has a maximum value at a wavelength of 555 nm (Figure 2-2), which is the wavelength at which the human eye is most responsive. Spectral luminous efficiency varies across different animal species this is discussed further in Section 2.2.

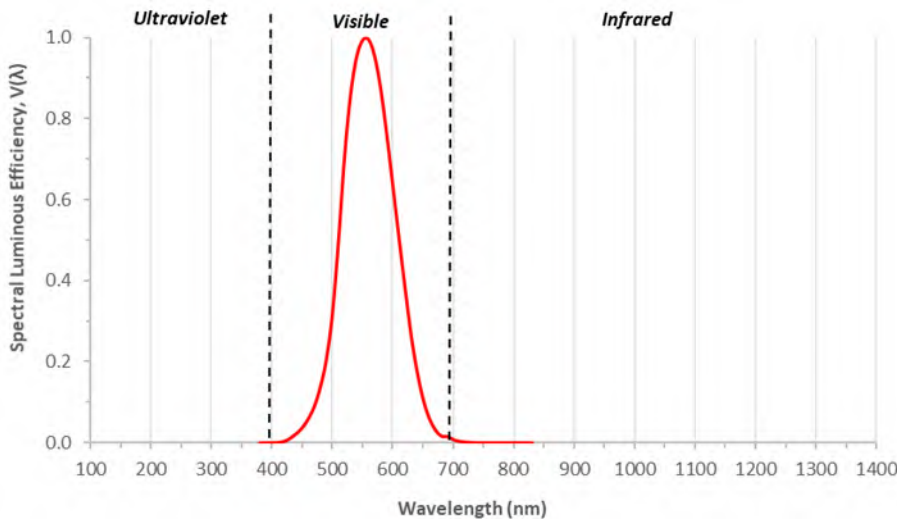


Figure 2-2: Spectral luminous efficiency function.

The spectral radiant power of a light source (Φ_E) is also related to wavelength, however, will also change depending on the type of light (Figure 2-3). The significance of a spectral power curve becomes apparent when using a photometric measurement to describe light for a source that is, for example, high in blue light emissions (such as cool LED or metal halide; Figure 2-3), or high in infrared emissions (such as a gas flare; Figure 2-4), as a photopic measurement may be underestimating the amount of light present as the photopic curve puts a higher weighting on light emitted in the green/yellow range compared to the blue or red (Figure 2-2).

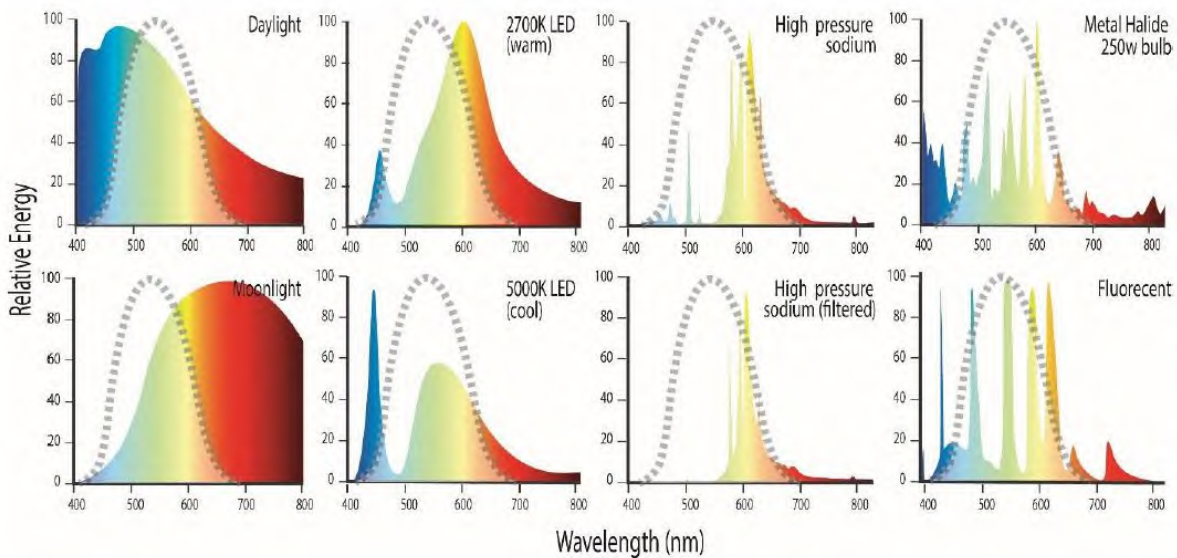


Figure 2-3: Relative spectral radiant power curves for common natural and artificial light sources (shown in colour) with photopic response curve (grey dashed line) (Commonwealth of Australia, 2023).

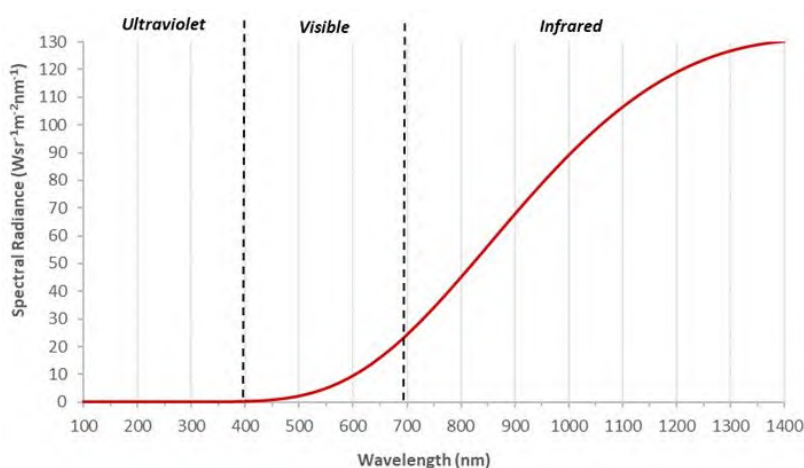


Figure 2-4: Predicted spectral radiance curve for a natural gas flare (based on 2,000 K blackbody emission).

2.2 Artificial Light Assessment

To date, light monitoring equipment has predominantly used photopic measurements. Few light measurement techniques that are appropriate for capturing biologically relevant light and are commercially available exist (Table 1 in Commonwealth of Australia (2023)). As described in Section 2.1, due to the photopic spectral luminous efficiency function being based on a human eye response, there is lower sensitivity in photometric measurements to shorter wavelength light (ultraviolet, violet, blue) that is important to nocturnally active marine fauna. For example, most wildlife is sensitive to short wavelength violet and blue light (Figure 2-1), but little or none of this light is measured by commercial instruments and thus not accounted for in current light models (Commonwealth of Australia, 2023). However, as noted within the National Light Pollution Guidelines (Commonwealth of Australia, 2023), photometric measures can be used in impact assessment on wildlife, but limitations should be acknowledged and considered.

For the light intensity (illuminance) modelling component of the artificial light emissions assessment for the Exploration Campaign (refer to Section 1), photometric measurements have been used. This decision was based on the type of published measured light data that was available to identify analogues and to use as input to the light modelling calculations.

As shown in Table 2-1, photometric light can be described in terms of luminous flux, luminous intensity and illuminance:

- Luminous flux (Φ_v) is a measure of the amount of light from a source emitted in total regardless of direction (unit of measurement: lumens),
- Luminous intensity (I_v) is the amount of light emitted in a particular direction; the direction is typically stated in steradians (unit of measurement: candelas), and
- Illuminance (E_v) is the amount of light reaching an area (unit of measurement: lux; where 1 lux is equivalent to 1 lumen/m²).

These terms are graphically depicted in Figure 2-5.



Illuminance (also referred to as light intensity) is the term of interest for environmental impact assessment for the Exploration Campaign. Typical light illuminance values from natural light sources are described in Table 2-2 and these are considered representative of ambient light levels in the vicinity of the Exploration Campaign in Victoria and King Island.

There are currently no published or accepted thresholds at which artificial light may impact fauna. Consequently, the minimum threshold used to describe a change in ambient light conditions within this artificial light assessment is an illuminance equivalent to a new moon / moonless clear night sky (0.001 lux). Beyond this threshold no impact to light sensitive fauna is assumed. This threshold (0.001 lux) was selected on the basis that fauna undertake nocturnal activities under the natural range of full moon (0.1 lux) to new moon (0.001 lux) without known adverse impacts.

In recognition that the photopic curve is biased towards a human eye response to light, and to remove some of the scientific uncertainty associated with the way light is measured, the 'Potential Impact Area' (i.e., the area relevant for impact assessment of planned light emissions; Table 1-1 conservatively uses an initial luminous intensity value 20% higher than the measured/modelled analogue value. This increase in luminous intensity increases the estimated distance of the Potential Impact Area and provides conservatism to the modelling and subsequent impact assessment.

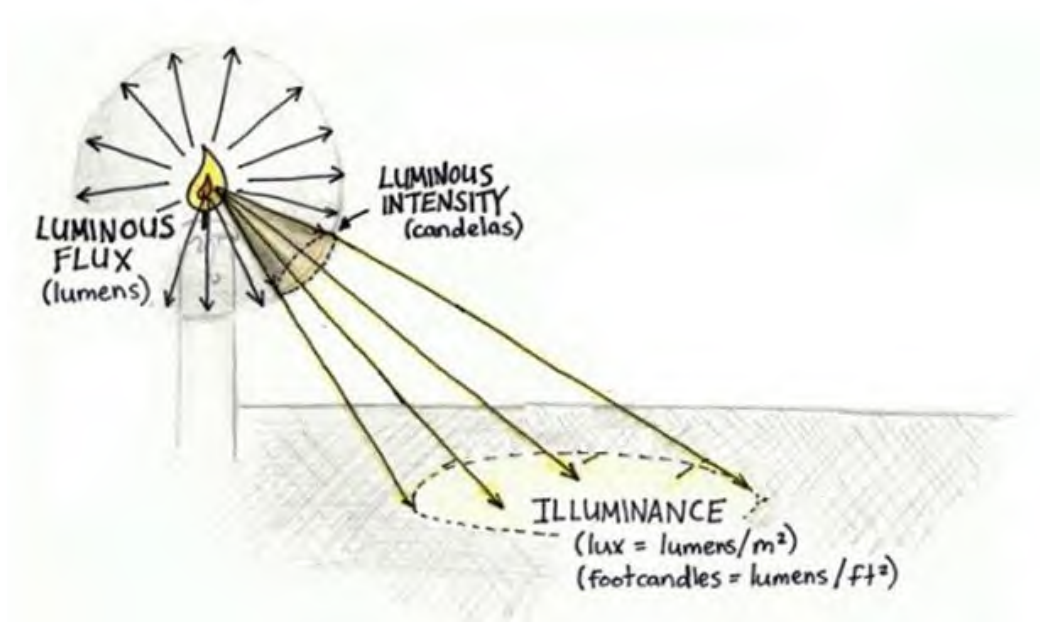


Figure 2-5 Photopic light terminology.



Table 2-2: Summary of natural light illuminance (Environmental Resources Management, 2010).

NATURAL LIGHT SOURCE	LIGHT ILLUMINANCE (LUX)
Direct sunlight	100,00–130,000
Full daylight, indirect sunlight	10,000–20,000
Overcast day	1,000
Very dark day	100
Twilight	10
Deep twilight	1
Full moon	0.1
Quarter moon	0.01
Moonless clear night sky (new moon) ¹	0.001
Moonless overcast night sky	0.0001

¹ Impact threshold utilised in this report is 0.001 lux, beyond this threshold no impact to light sensitive fauna is assumed.



3 VISIBLE LINE OF SIGHT ASSESSMENT

3.1 Methodology

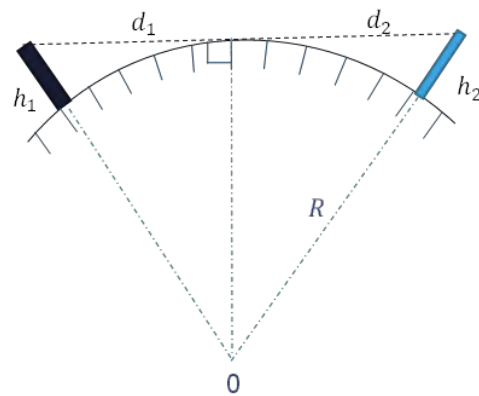
Visible line of sight assessment was conducted using the methodology described in Stallings (2005) for the MODU to determine the worst-case potential extent of visible light for ConocoPhillips. Line of sight and viewshed analysis is typically used in environmental impact assessment for the assessment of impact to visual amenity where an impact may alter a perceived sense of place or inherent value. The visibility of an artificial light does not imply a measurable change in ambient light (and therefore a potential environmental impact), this is estimated though change to illuminance as discussed in Section 4).

Line of sight assessment utilises the following equation to estimate the total line of sight (d):

$$d = \left(\frac{8}{3}Rh_1 + h_1^2\right)^{0.5} + \left(\frac{8}{3}Rh_2 + h_2^2\right)^{0.5}$$

Where

- d = total line of sight ($d_1 + d_2$),
- h_1 = height of object,
- h_2 = height of receptor, and
- R = radius of earth.



The analysis was completed using assumed heights of an analogue MODU for the Exploration Campaign as shown in Table 3-1, with final designs being confirmed during front end engineering (FEED). Receptor heights modelled included a receptor at sea level, and varying elevations (from 5 to 525 m) of the adjacent mainland.

Table 3-1: Assumed heights of the MODU facility infrastructure involved in the Exploration Campaign.

EXPLORATION CAMPAIGN FACILITY INFRASTRUCTURE	HEIGHT OF FACILITY / LIGHTING / FLARE (m) ABOVE SEA LEVEL
Derrick (navigation lights)	85
Deck (working lights)	22
Flare flame height (horizontal boom)	35



3.2 Results and Recommendations

The line-of-sight assessment results for the different heights of the MODU facilities and receptors are outlined in Table 3-2. The assessment shows that at sea level, the maximum distance the tip of the MODU derrick (navigation lights) would be visible above the horizon is 38 km. The flare and equipment above main deck level would be visible from 25 km from the MODU location.

Figure 3-1 and Figure 3-2 show the extent of visibility for the MODU derrick (navigation lights) and the deck flare respectively, including the total line of sight distances and the Environment that May Be Affected (EMBA) which is within 20 km for light. Note that exploration drilling is restricted to the petroleum title, therefore the extent of visibility of the rig was based on the operational area within the petroleum title boundary.

The line-of-sight assessment indicates that lights on the derrick and light associated with flaring may be visible as a dot on the horizon from the adjacent mainland, extending inland up to 140 km for elevated receptor locations. However, this line-of-sight distance was estimated without considering the atmospheric interactions/disturbances, and thus is a conservative estimation. Considering the luminance range of human vision, the extent of potential visibility is more likely up to only 49 km when the light intensity reaches 0.001 lux, equivalent to an ambient light intensity level of a moonless clear night sky (which will be shown further in the light intensity (illuminance) Section 4). It is recommended to conduct a Zone of Theoretical Visibility analysis to quantify the visual impact and provide a communication tool to the relevant stakeholders.

King Island is approximately 147 km away from the operational area with a maximum receptor height of 165 m, as such, it is not affected by the light emissions from VIC/P79N (not shown in figures).

Table 3-2: Exploration Campaign facility visual line of sight distances.

EXPORATION CAMPAIGN INFRASTRUCTURE	HEIGHT OF FACILITY / LIGHTING / FLARE (m)	HEIGHT OF RECEPTOR (m)	TOTAL LINE OF SIGHT (km)
Visibility of MODU infrastructure at sea level			
Derrick (navigation lights)	85	0	38
Flare flame height (horizontal boom)	35	0	25
Deck (working lights)	22	0	19
Visibility of MODU derrick at various receptor heights			
Derrick (navigation lights)	85	5	47
	85	10	51
	85	50	67
	85	100	79
	85	300	109
	85	525	132

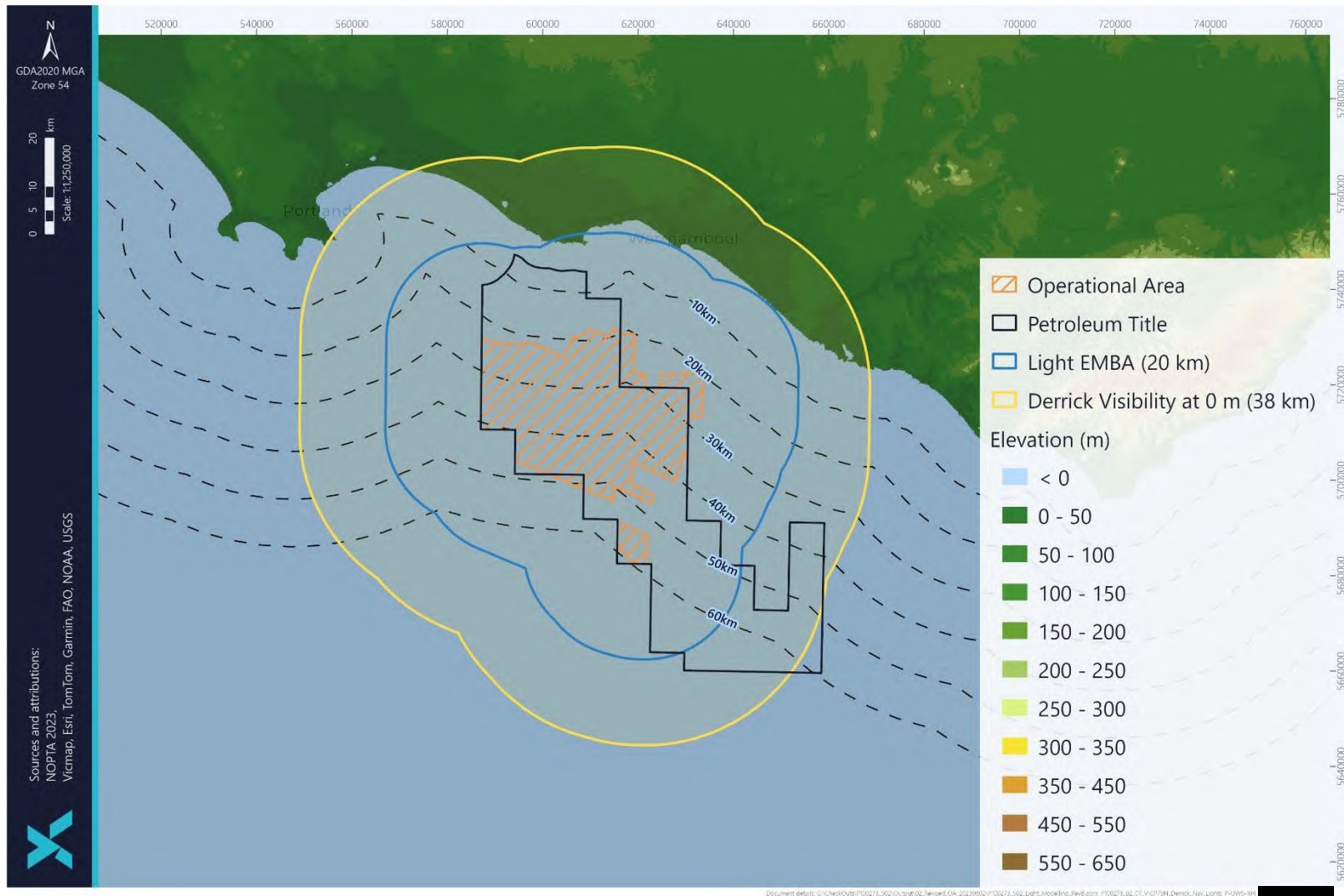


Figure 3-1: Light EMBA and area of visibility (derrick navigation lights).

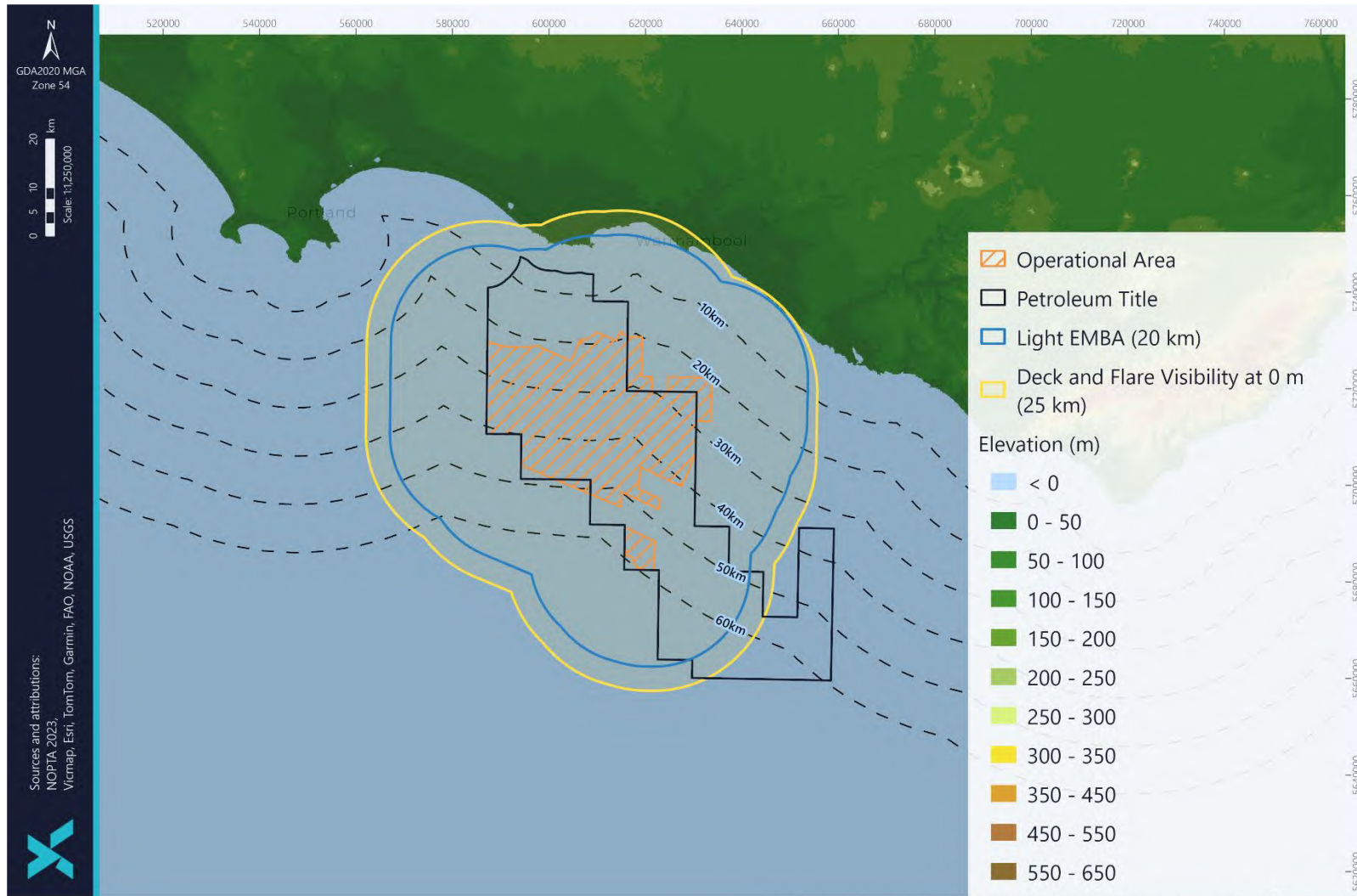


Figure 3-2: Light EMBA and area of visibility (light associated with flaring).



4 LIGHT INTENSITY (ILLUMINANCE) ASSESSMENT

The two sources of artificial lighting (facility and flaring) for the Exploration Campaign were assessed separately, using published modelled and measured data as analogues.

It is noted that most commercial light modelling software requires the input of a number of factors, such as the light fitting type, quantity, and location of light sources – information which is not available at this preliminary stage. As such, the use of analogues was adopted, as this provided a real-world analogue on which to base the artificial light emissions assessment. It is also considered a conservative approach as it does not include any best practice or additional mitigation measures that may be adopted by ConocoPhillips during the FEED of the project.

4.1 Facility Lighting

It is expected that the MODU for the Exploration Campaign will have a similar lit surface area as the drill rig utilised for the Woodside Torosa drilling campaign on Browse reef for which published data is available. The MODU utilised for the Exploration Campaign will be similar with similar lighting required for safe operations of the facility. Therefore the MODU facility light emissions would also be comparable to that of the Torosa wells used during a previous light intensity modelling and associated measured data completed by Environmental Resources Management (2010). Light characteristics and modelling of light sources for the Torosa assessment are based on measured lighting data (lux levels and wavelength) obtained whilst drilling the Torosa South-1 appraisal well on the edge of the South Reef lagoon and ambient data when no activities were occurring at Scott Reef (Environmental Resources Management, 2010). The drill rig used is a suitable analogue for the drill rig expected to be used for the VIC/P79N Exploration Campaign.

The light intensity values derived from the measured Torosa South 1 well campaign were utilised to represent the MODU facility lighting for the Exploration Campaign modelling.

4.2 Flare Light Emissions

The Exploration Campaign will require a MODU flare to dispose of the gas generated from well testing. The gas is produced and flared to allow for testing of the produced gas and oil as well as to calculate the size of the oil and gas reservoir and reservoir characteristics. The excess oil and gas is sent to the flare disposal system to be burnt. The flare for the MODU will be a horizontal boom flare extending out horizontally of the MODU deck. Flaring will occur for a duration of approximately 42 hours per well.

To inform the environmental impact assessment for the Exploration Campaign, light intensity from a flare flow rate of 40 MMscfd was modelled. This represents a peak flaring rate from the well test systems.

Based on Gas Processors Suppliers Association (2004), it has been calculated that this expected rate of flaring will result in a flare flame length of up to approximately 13 m. This flame will generate light. Analogues are utilised to determine the likely amount of light emitted from the flame. This is discussed in Section 4.3.2.



4.3 Methodology

4.3.1 Inverse Law

The light intensity modelling used the inverse square law of illuminance which states that *a doubling of distance results in a reduction in illuminance by four times*, i.e., as a surface that is illuminated by a light source moves away from the light source, the surface appears dimmer. Light emitted becomes dimmer in an inverse square relationship to distance as represented in Figure 4-1 and in the mathematical equation below:

$$E = \frac{I}{D^2}$$

Where

- E = illuminance (in lux),
- I = luminous intensity (in candela), and
- D = the distance from the light source in meters.

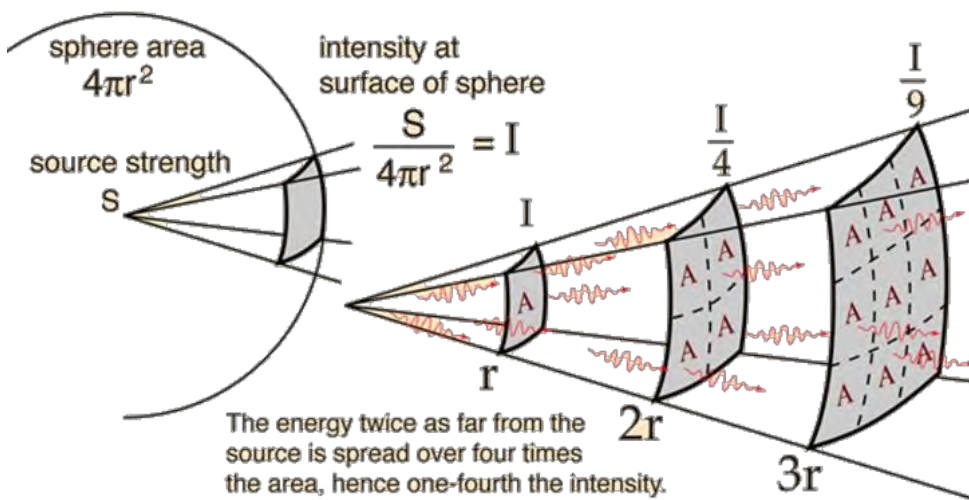


Figure 4-1: Inverse square law.



4.3.2 Analogues

As flares are not designed to be luminous, there is some uncertainty in calculating luminous intensity from a flare. To reduce the uncertainty, light measurements from an analogue, existing flares have been utilised to calculate likely light emissions from the flare. These analogues are documented within publicly available literature on light emissions from flares.

The analogues for gas flares were identified and are detailed in Table 4-1.

Table 4-1: Details of potential analogue natural gas flares.

ANALOGUE SITE	FACILITY TYPE	FLARE RATE	LUMINANCE INTENSITY	ILLUMINANCE METHOD	REFERENCE
Galoc FPSO – Philippines	Tamarind operated FPSO oil facility: Continuous gas flare	~15 MMscfd, 18–20 m high flame	Not specified	N/A (Flame height provided only)	Tamarind (2019)
Wheatstone LNG Plant – Onslow, WA	Chevron-operated onshore LNG facility: Safety flare	Not specified	Not specified	Modelled Illuminance (lux)	URS Australia (2010)
Narrabri Gas Project – Bibblewindi, NSW	Proposed Santos-operated onshore gas production facility: Safety flare	244 MMscfd, 30 m high flame	Not specified	Modelled Illuminance (lux) based on measured and calculated source data	Imbricata Environmental (2018)
Obigbo Oil Production Facility – Nigeria	Shell-operated oil production facility: Continuous flaring of associated gas	30 MMscfd	~1,805,000 cd	Measured Illuminance (lux)	Isichei and Sanford (1976) Nwaobi (2005) European Commission (2014)

The four analogues were compared to the expected flare characteristics (rates, flame heights) for the Exploration Campaign to determine if they were appropriate for use in this light emissions assessment.

The Galoc FPSO has a continuous flare which operates at a flare rate of ~15 MMscfd. However, it has not had light intensity levels or illuminance levels measured or modelled and is therefore not considered further within this light intensity assessment.



The Wheatstone LNG flare has modelled illuminance information, but no details on flare rate are publicly available. As this information is unknown, the Wheatstone LNG flare was not carried through to the next stage of assessment as a potential analogue.

Despite the similar flame height (30 m for Narrabri compared to the 22 m from the Exploration Campaign MODU), the Narrabri gas flare rate is >200 MMscfd, which is an order of magnitude higher than that for the Exploration Campaign, and as such was not considered an appropriate analogue and is not discussed further in this assessment.

The Obigbo facility has a continuous flare that is of similar scale and has a flare rate (30 MMscfd) close to the rate expected for the Exploration Campaign (40 MMscfd). For these reasons, the Obigbo oil production facility was considered an appropriate analogue for the MODU flare. A detailed study describing lux levels at varying distances from the operational flare was also available for the Obigbo oil production facility (Isichei and Sanford, 1976). The detail provided in that study, as well as Nwaob (2005) and European Commission (2014) allow for the characteristics of the Obigbo flare to be scaled and for characterisation of other flares. This data provides the basis for the following flare light intensity modelling.

4.3.3 Model

The light intensity model was built in Microsoft Excel utilising the inverse law of illumination (Section 4.3.1). The following assumptions were made.

- Obigbo oil production facility flare characteristics as stated in Table 4-1,
- Combustion characteristics of the Exploration Campaign flare are similar to Obigbo,
- No allowance was made for atmospheric or topographic interactions including shadowing, absorption or scattering, as such the model is conservative and likely to overestimate illuminance at distance,
- Flare luminous intensity is calculated directly proportional to flare flow rate, and
- Facility luminous intensity is combined with the flare luminous intensity as a total luminous intensity input into the model.

Illuminance was calculated every 100 m from the flare source (in lux), and results overlaid in geographic information system (GIS) to identify geospatial contours.

A verification exercise of the Xodus Group light decay model (Xodus model) was conducted using the light decay model developed by Jacobs–SKM for the Browse FLNG Draft Environmental Impact Statement (Jacobs–SKM, 2014). The verification exercise for the Xodus model plotted the Xodus Group light decay model expected illuminance for the Browse Development against the Jacobs–SKM modelled illuminance. The Xodus model predicted illumination levels aligned with the Jacobs–SKM model, verifying the Xodus model outcomes.



4.4 Results and Recommendations

The results of the light intensity modelling are summarised in Table 4-2 and are also shown graphically for the Exploration Campaign in Figure 4-2 to Figure 4-5. Note that for Figure 4-2, the exploration drilling is restricted to the petroleum title, therefore the extent of visibility of the rig was based on the operational area within the petroleum title boundary.

Table 4-2: Illuminance modelling results and Obigbo analogue.

SITE/SCENARIO	FLARE LUMINANCE INTENSITY (CD)	LIGHT ILLUMINANCE (LUX)							
		Distance from Facility (km)							
		0.5 km	1 km	5 km	10 km	20 km	30 km	60 km	
Analogue Case									
Obigbo Facility – Nigeria	~1,805,000	7.2	1.8	0.072	0.018	0.004	0.002	< 0.002	
Modelled Cases									
Exploration Campaign facility lighting from the MODU	~100,000	0.4	0.1	0.004	0.001	0.0002	<0.0001	<0.0001	
Exploration Campaign combined facility lighting and flaring from the MODU (40 MMscfd)	~ 2,495,667	10.0	2.5	0.100	0.025	0.006	0.003	0.0007	

For the Exploration Campaign, the model predicted the following for the combined facility lighting and flaring rate of 40 MMscfd during flaring (Figure 4-2 and Figure 4-3):

- Light intensity levels greater than 0.1 lux are predicted to occur up to 5 km from the MODU, comparable to ambient light levels during full moon to twilight.
- Between 5 km and 16 km from the MODU, the model predicted light intensity levels comparable to ambient light levels during a quarter moon to full moon night sky (0.01 lux to 0.1 lux).
- Between 16 km and 49 km, light intensity levels were predicted to be between 0.01 lux and 0.001 lux, which is comparable to ambient light intensity levels between a moonless clear night sky and a quarter moon.
- Beyond 49 km, there was no measurable change to the ambient light intensity levels.

For the Exploration Campaign, the model predicted the following for the facility lighting when not flaring (Figure 4-4 and Figure 4-5):

- Light intensity levels greater than 0.1 lux are predicted to occur up to 1 km from the MODU, comparable to ambient light levels during full moon to twilight.
- Between 1 km and 3 km from the MODU, the model predicted light intensity levels comparable to ambient light levels during a quarter moon to full moon night sky (0.01 lux to 0.1 lux).
- Between 3 km and 9 km, light intensity levels were predicted to be between 0.01 lux and 0.001 lux, which is comparable to ambient light intensity levels between a moonless clear night sky and a quarter moon. Beyond 9 km, there was no measurable change to the ambient light intensity levels.

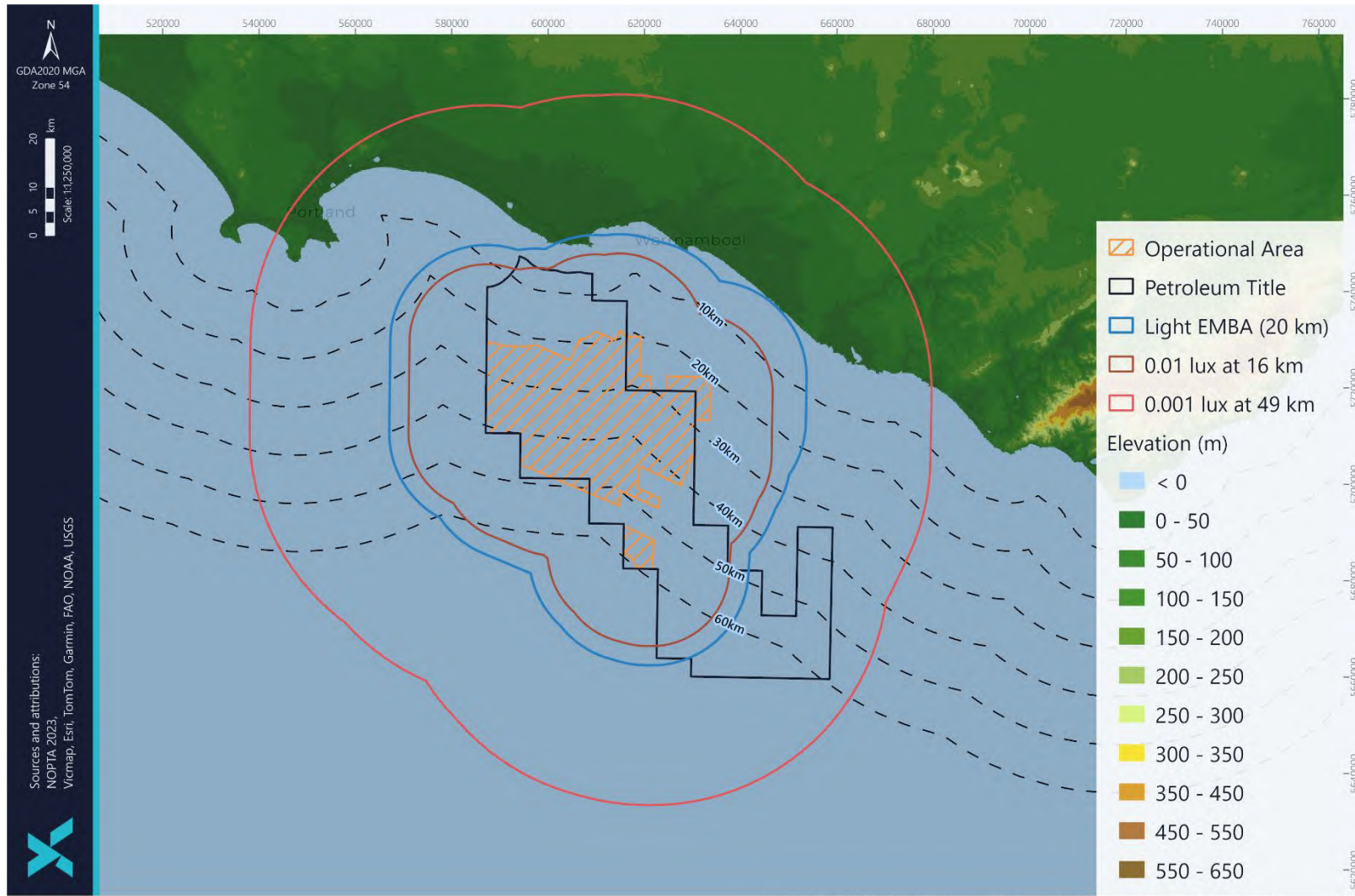


Figure 4-2: Map of expected light intensity (illuminance) levels from flare and facility lighting on the MODU during flaring (40 MMscfd).

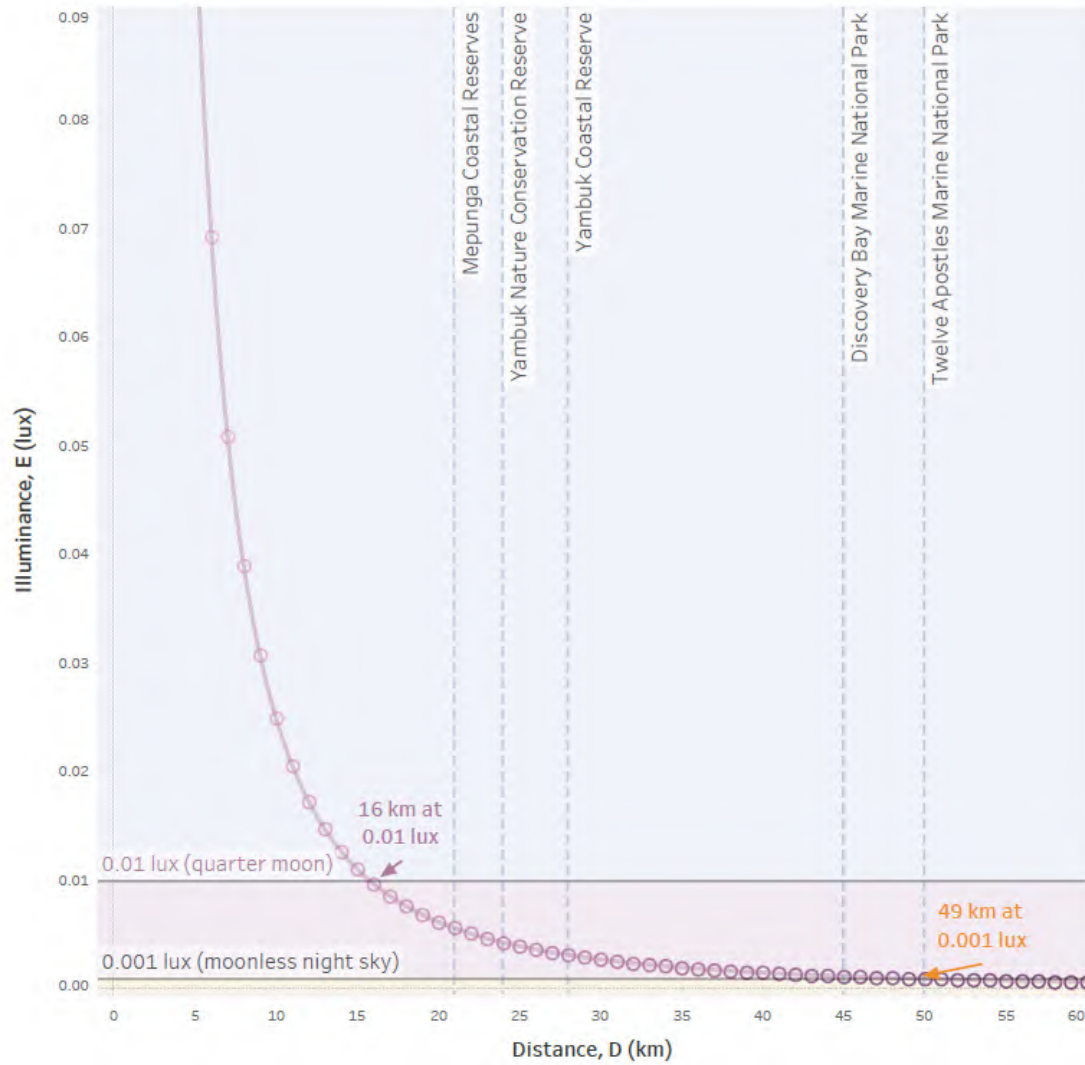


Figure 4-3: Expected light intensity levels from flare and facility lighting on the MODU during flaring (40 MMscfd) at receptor locations.

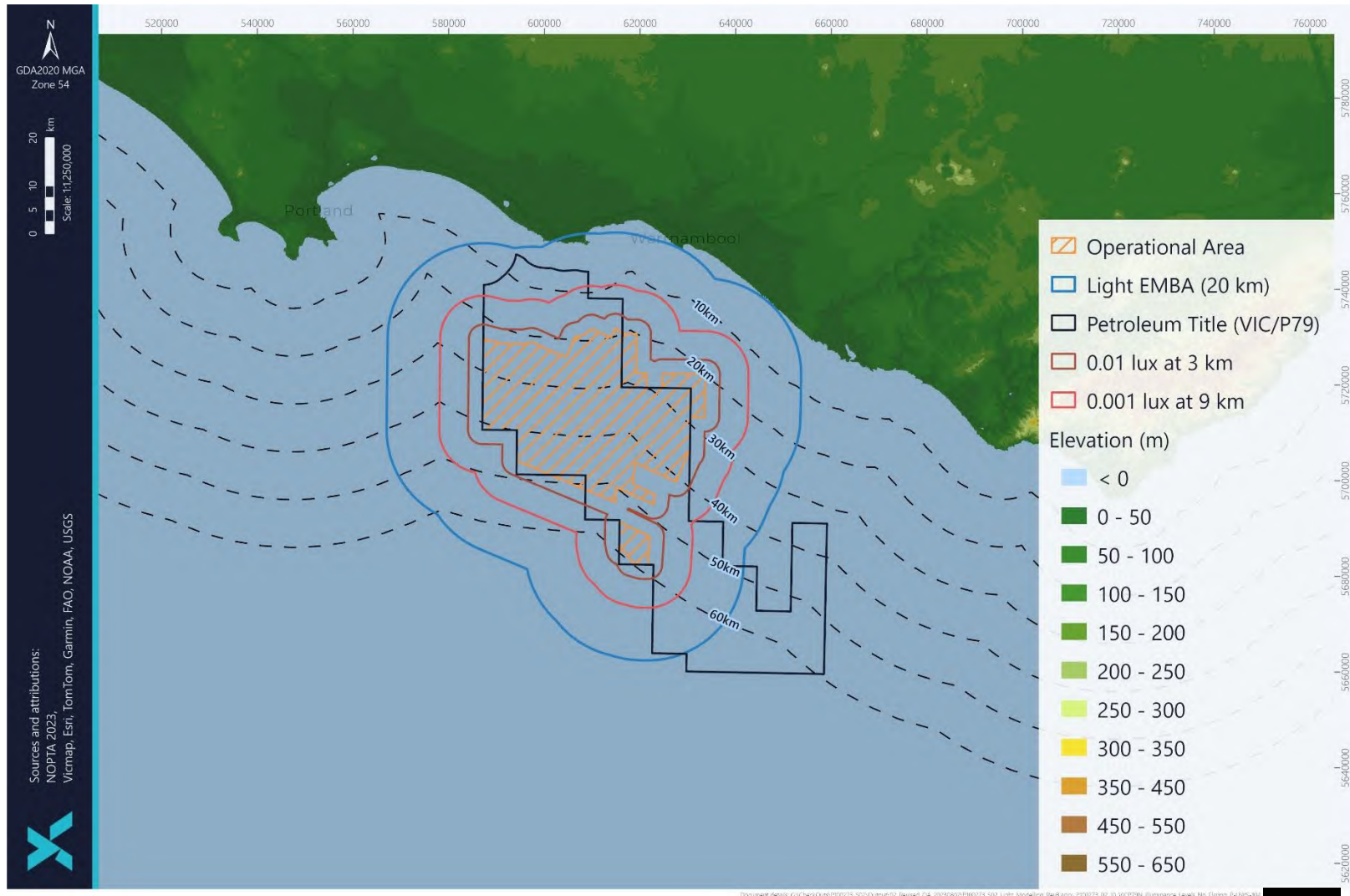


Figure 4-4: Map of expected light intensity (illuminance) levels from facility lighting on the MODU when not flaring.

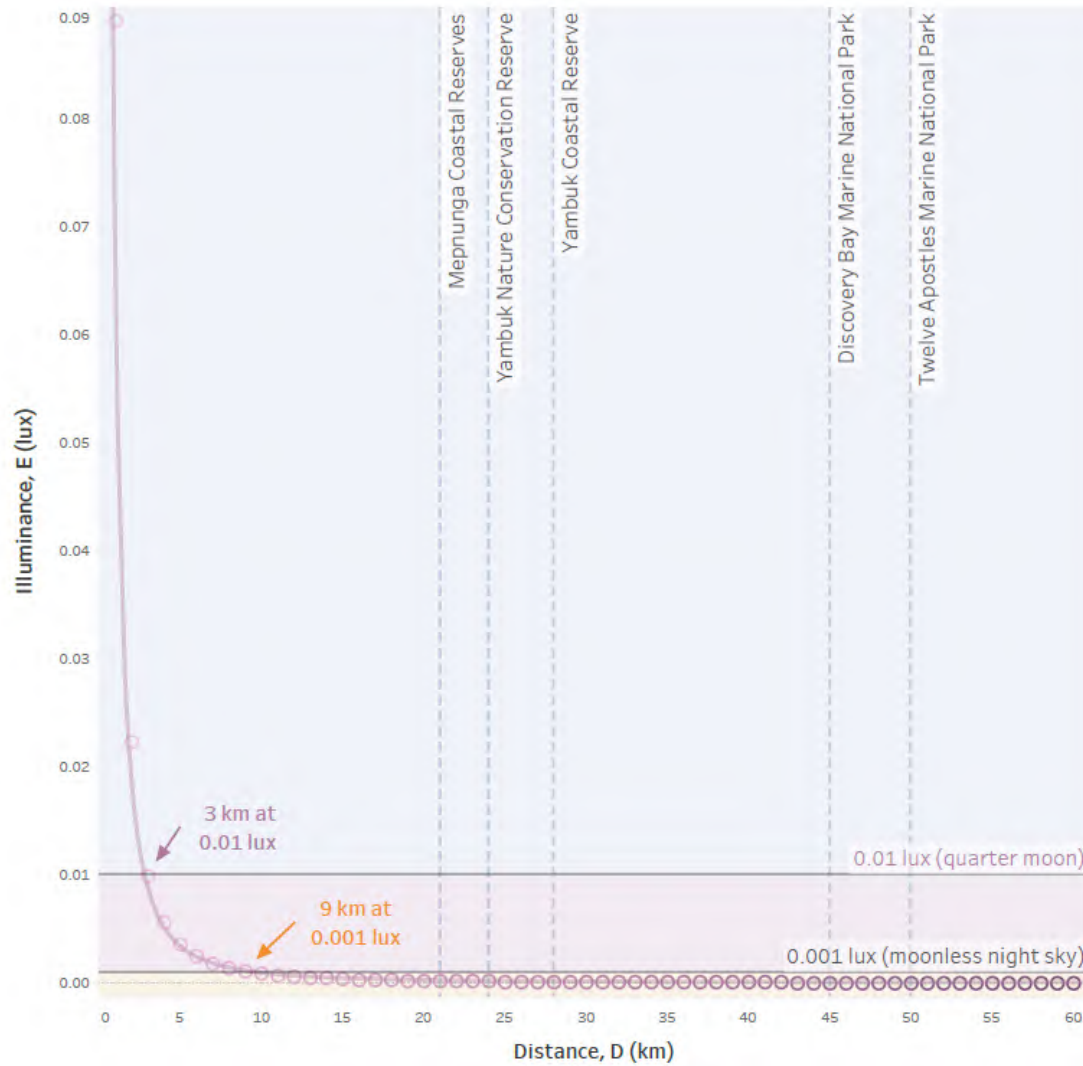


Figure 4-5: Expected light intensity levels from facility lighting on the MODU at receptor locations when not flaring.



As noted in Section 2.2, in recognition that photometric measurements are biased towards the human eye response to light, the spatial extent potentially impacted by visible light from the MODU, as a visible dot on the horizon, is out to a distance of 9 km from the position of the MODU when not flaring (Figure 4-4 and figure 4-5). Note: This is distinct from the biological light EMBA which is relevant for the potential assessment of impacts to, for example, birds.

The spatial extent potentially impacted by visible light from flaring and MODU lighting, as a visible dot on the horizon, is out to a distance of 49 km from the position of the MODU (Figures 4-2 and 4-3).

As shown in Figure 4-3 and figure 4-5, at the selected receptor locations of Mepunga Coastal Reserve (21 km), Yambuk Nature Conservation Reserve (24 km), Yambuk Coastal Reserve (28 km), Discovery Bay Marine National Park (45 km), Twelve Apostles Marine National Park (50 km), and the nearby towns, the light intensity levels are comparable to the ambient light levels less than a quarter moon (<0.01 lux) when flaring, and less than a moonless clear night sky (<0.001 lux) when not flaring, equivalent to the 'First Quarter' and 'New' moon phases in Figure 4-6, respectively.



Figure 4-6: The moon phases Credit: NASA/Bill Dunford (Johnston, 2020).



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ConocoPhillips Australia

VIC/P79 Otway Drilling Campaign

Light Modelling Study for VIC/P79 South

ASSIGNMENT P100273-S04
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EXECUTIVE SUMMARY

This technical report presents the results of the visible line of sight and light intensity (illuminance) assessments for ConocoPhillips Australia's (ConocoPhillips) Otway Exploration Drilling Campaign (Exploration Campaign). This light modelling study was conducted for the Exploration Campaign within the southern part of petroleum title VIC/P79 (VIC/P79S). The sources of light emissions considered were the lights and flare from the mobile offshore drilling unit (MODU). The lights on the MODU facility include the working lights on the deck and the navigation lights on the derrick. The light that come from the flaring during well testing was assumed to have the same height as the helicopter deck and was considered at a maximum flare rate of 40 MMscfd.

The threshold for the spatial extent of visible light that is predicted to occur from the Exploration Campaign was defined as whether any part of the facility is visible as a dot on the horizon (visible line of sight assessment). The threshold for the spatial extent of a measurable change in ambient light that is predicted to occur from the Exploration Campaign was defined as an illuminance equivalent to ambient light on a moonless clear night sky/new moon (<0.001 lux). The area within these thresholds is considered relevant to the impact assessment for planned light emissions from the Exploration Campaign.

The results of visible line of sight assessment conclude that the MODU lights and flare will be visible from a distance of 38 km from receptors at sea level. Due to the elevation of viewpoints on the mainland, the MODU may be visible from the Victorian mainland adjacent to the project area.

Light intensity (illuminance) assessment indicates that during flaring, a measurable change will occur up to 49 km from the expected position of the MODU and reduces to 9 km from the MODU when not flaring.

The light intensity results also show that the light intensity levels of the MODU at the selected receptor locations of Twelve Mepunga Coastal Reserve (31 km) and Apostles Marine National Park (33 km) are comparable to the ambient light levels less than a quarter moon (0.01 lux) when flaring and less than a moonless clear night sky (0.001 lux) when not flaring. For other selected receptor locations – Yambuk Nature Conservation Reserve (54 km), Yambuk Coastal Reserve (59 km), Coradjil Nature Conservation Reserve (59 km), Great Otway National Park (62 km), and the nearby towns, the light intensity levels are comparable to the ambient light levels less than a moonless clear night sky (0.001 lux) both when flaring and when not flaring.

A Zone of Theoretical Visibility analysis is thus recommended to quantify the visual impact and provide a communication tool to the relevant stakeholders.



1 INTRODUCTION

1.1 Project Overview

The Otway Exploration Drilling Campaign is located adjacent to the largest gas fields in the offshore Otway Basin, Thylacine and Geographe. ConocoPhillips Australia (ConocoPhillips) plan to execute an exploration well drilling campaign within the southern part of VIC/P79 (denoted as VIC/P79S), as shown in Figure 1-1. This report presents the light modelling study for the Exploration Campaign within VIC/P79S.

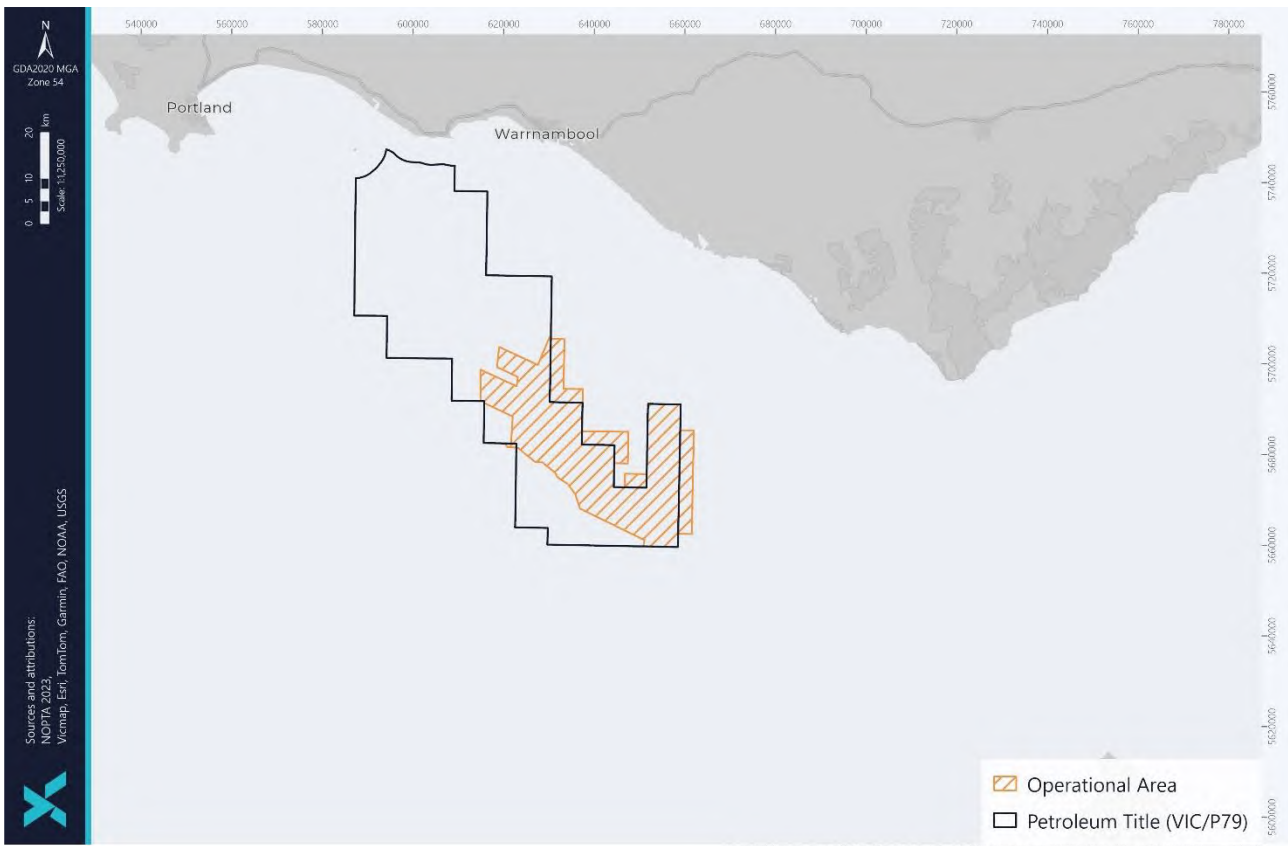


Figure 1-1: Otway drilling light modelling scope for VIC/P79S.

1.2 Aim and Objectives

The purpose of this technical report is to present the assessment undertaken to estimate the artificial light emissions from the Exploration Campaign within VIC/P79S to inform environmental impact assessment and management planning of the Exploration Campaign. This study considered and assessed:

- the distances of receptors from the mobile offshore drilling unit (MODU),
- light sources and flaring from the MODU, and
- the light levels received at various receptor locations from facility lighting and well test flaring.



1.3 Scope

The sources of light emissions include:

- external facility lighting on MODU and vessels for safe navigation and working conditions, and
- flaring of excess associated gas which will be from a horizontal boom flare and will occur up to approximately 100 hours per well.

Both sources of light emissions are quantified and discussed in this technical report. The exact well locations are yet to be determined. Therefore, all potential locations in VIC/P79S were considered for modelling (Figure 1-1).

The assessment included two sets of modelling:

- visible line of sight estimates, and
- light intensity (illuminance) modelling.

Line of sight estimates have been used as an indication of the distance that the facility and its lights may be visible while light intensity (illuminance) modelling has been used as an indication of the measurable change in ambient light conditions. These quantifications have been used to develop two types of area used for subsequent environmental impact analysis (Table 1-1).

Table 1-1: Predicted artificial light exposure and impact areas for the Exploration Campaign.

ARTIFICIAL LIGHT ASSESSMENT AREAS	DESCRIPTION
Visible Light Exposure Area	The spatial extent of visible light that is predicted to occur from the Exploration Campaign. The threshold for this area is whether any part of the facility is visible as a dot on the horizon.
Potential Impact Area	The spatial extent of a measurable change in ambient light that is predicted to occur from the Exploration Campaign. The threshold for this area is an illuminance equivalent to ambient light on a moonless clear night sky/new moon (<0.001 lux). This is the area relevant to the impact assessment for planned light emissions from the Exploration Campaign.

The modelling utilises the MODU as the basis for modelling as it will be the largest and tallest piece of infrastructure that will be infield for the Exploration Campaign. The light intensity modelling utilises the two major sources of light emissions as the basis for the model – the MODU lighting and flaring from the MODU for well testing. Artificial light emissions from vessels (e.g., support vessels) associated with the Exploration Campaign were not included in the assessment due to their much smaller scale and/or temporary and transient nature.



2 BASIS OF LIGHT ASSESSMENT

2.1 Light and its Measurement

Light is a form of energy that is emitted over a particular band of frequencies and wavelengths of the electromagnetic spectrum, and includes ultraviolet, visible (to humans) light and infrared light. As illustrated in Figure 2-1, the visible range for humans is approximately 400–700 nm. Fauna perceive light differently to humans, and their visible spectrum can vary between ~300 nm and >700 nm depending on the species (Commonwealth of Australia, 2023).

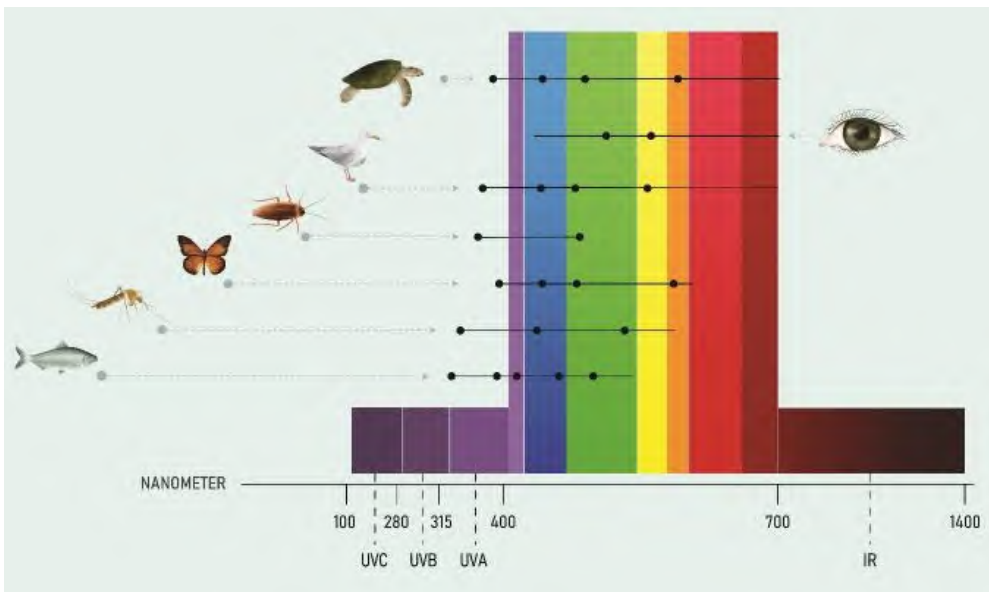


Figure 2-1: Ability to perceive different wavelengths of light in humans and wildlife is shown by horizontal lines. Black dots represent reported peak sensitivity. Note the common sensitivity to short wavelength light across all wildlife (Campos, 2017; Commonwealth of Australia, 2023).

Humans and fauna use photoreceptor cells (cones and rods) in the eye to detect light. Photopic vision, which occurs in bright conditions, activates the cones and allow the eye to see colour. Scotopic vision, which occurs in low light conditions, activates rods and allow the eye to see in shades of grey. Scotopic vision is more sensitive to shorter wavelength light than photopic visions (Commonwealth of Australia, 2023). Nocturnal species rely on scotopic vision and can therefore be sensitive to changes in light at high-energy, short-wavelength end of the spectrum (e.g., ultraviolet, violet and blue light).

Radiometry is the detection and measurement of electromagnetic radiation. With respect to optics, radiometry refers to the detection and measurement of radiant energy within the light (ultraviolet, violet, infrared) portion of the electromagnetic spectrum. Photometry is a subset of radiometry that applies to the visible light spectrum and measured values are also weighted to the typical response of a human eye. As humans and fauna perceive light differently, radiometric measurements are more biologically relevant, as they account for the energy emitted across all light wavelengths (Commonwealth of Australia, 2023). Common quantities used to describe light in radiometric and photometric terms are provided in Table 2-1.



Table 2-1: Typical radiometric and photometric quantities.

RADIOMETRIC			PHOTOMETRIC		
Quantity	Symbol	Units	Quantity	Symbol	Units
Radiant power	Φ_E	W	Luminous flux	Φ_V	lm
Radiant intensity	I_E	W/sr	Luminous intensity	I_V	lm/sr (or cd)
Irradiance	E_E	W/m ²	Illuminance	E_V	lm/m ² (or lux)
Radiance	L_E	W/m ² sr	Luminance	L_V	lm/m ² sr

E = energetic; V = visual; W = watt; sr = steradian; lm = lumen; cd = candela

The conversion between radiometric and photometric units is dependent on the photopic spectral luminous efficiency function, $V(\lambda)$, as defined by the Commission International de l'Eclairage (CIE) in 1924, and the spectral radiant power curve, $\Phi_E(\lambda)$, of the light source. The conversion is provided by the following relationship:

$$\Phi_V = K_m \int_{\lambda=380}^{\lambda=830} \Phi_E(\lambda) V(\lambda) \delta\lambda$$

Where:

- Φ_V is the luminous flux (lumens),
- K_m is a scaling factor equivalent to 683 lm/W,
- $\Phi_E(\lambda)$ is the spectral radiant power (W/nm), and
- $V(\lambda)$ is the photopic spectral luminous efficiency function.

The photopic spectral luminous efficiency function, $V(\lambda)$, is a function of wavelength and relates to how a human eye responds to that wavelength of light. In humans the photoreceptor cells are more responsive to green/yellow wavelength light compared to red or violet. $V(\lambda)$ can be approximated by the following non-linear regression:

$$V(\lambda) = 1.019e^{-285.4(\lambda-0.559)^2}$$

Empirical data shows that the function has a maximum value at a wavelength of 555 nm (Figure 2-2), which is the wavelength at which the human eye is most responsive. Spectral luminous efficiency varies across different animal species this is discussed further in Section 2.2.

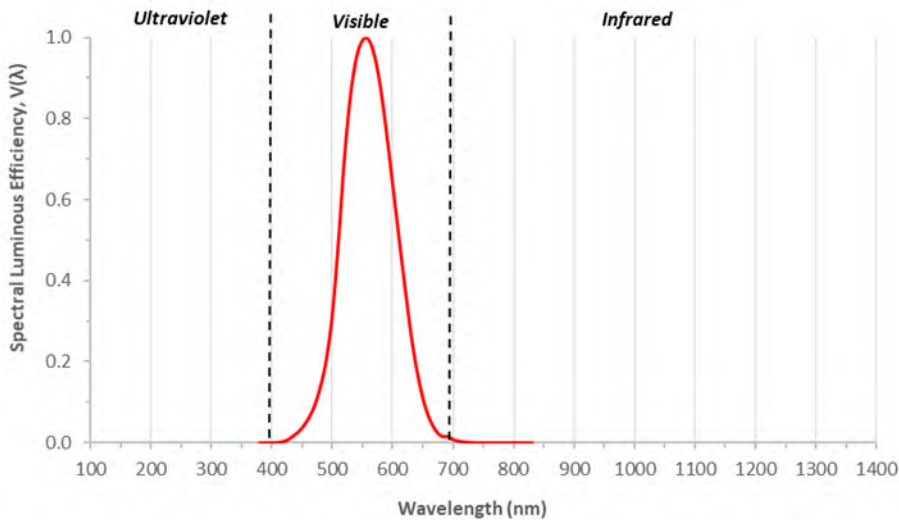


Figure 2-2: Spectral luminous efficiency function.

The spectral radiant power of a light source (Φ_E) is also related to wavelength, however, will also change depending on the type of light (Figure 2-3). The significance of a spectral power curve becomes apparent when using a photometric measurement to describe light for a source that is, for example, high in blue light emissions (such as cool LED or metal halide; Figure 2-3), or high in infrared emissions (such as a gas flare; Figure 2-4), as a photopic measurement may be underestimating the amount of light present as the photopic curve puts a higher weighting on light emitted in the green/yellow range compared to the blue or red (Figure 2-2).

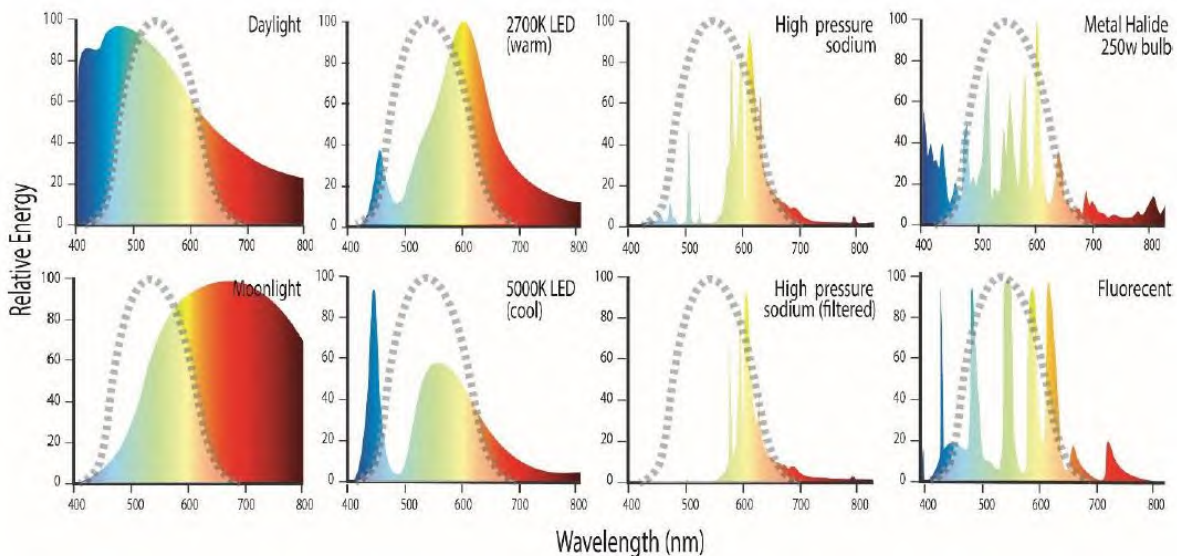


Figure 2-3: Relative spectral radiant power curves for common natural and artificial light sources (shown in colour) with photopic response curve (grey dashed line) (Commonwealth of Australia, 2023).

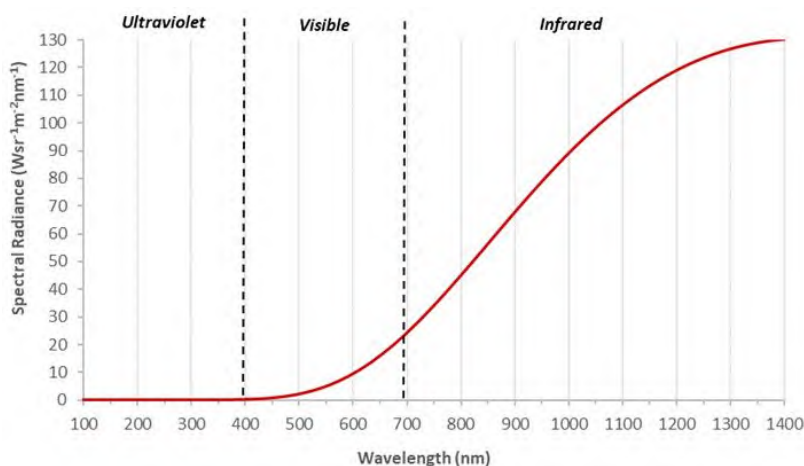


Figure 2-4: Predicted spectral radiance curve for a natural gas flare (based on 2,000 K blackbody emission).

2.2 Artificial Light Assessment

To date, light monitoring equipment has predominantly used photopic measurements. Few light measurement techniques that are appropriate for capturing biologically relevant light and are commercially available exist (Table 1 in Commonwealth of Australia (2023)). As described in Section 2.1, due to the photopic spectral luminous efficiency function being based on a human eye response, there is lower sensitivity in photometric measurements to shorter wavelength light (ultraviolet, violet, blue) that is important to nocturnally active marine fauna. For example, most wildlife is sensitive to short wavelength violet and blue light (Figure 2-1), but little or none of this light is measured by commercial instruments and thus not accounted for in current light models (Commonwealth of Australia, 2023). However, as noted within the National Light Pollution Guidelines (Commonwealth of Australia, 2023), photometric measures can be used in impact assessment on wildlife, but limitations should be acknowledged and considered.

For the light intensity (illuminance) modelling component of the artificial light emissions assessment for the Exploration Campaign (refer to Section 4), photometric measurements have been used. This decision was based on the type of published measured light data that was available to identify analogues and to use as input to the light modelling calculations.

As shown in Table 2-1, photometric light can be described in terms of luminous flux, luminous intensity and illuminance:

- Luminous flux (Φ_v) is a measure of the amount of light from a source emitted in total regardless of direction (unit of measurement: lumens),
- Luminous intensity (I_v) is the amount of light emitted in a particular direction; the direction is typically stated in steradians (unit of measurement: candelas), and
- Illuminance (E_v) is the amount of light reaching an area (unit of measurement: lux; where 1 lux is equivalent to 1 lumen/m²).

These terms are graphically depicted in Figure 2-5.



Illuminance (also referred to as light intensity) is the term of interest for environmental impact assessment for the Exploration Campaign. Typical light illuminance values from natural light sources are described in Table 2-2 and these are considered representative of ambient light levels in the vicinity of the Exploration Campaign in Victoria and King Island.

There are currently no published or accepted thresholds at which artificial light may impact fauna. Consequently, the minimum threshold used to describe a change in ambient light conditions within this artificial light assessment is an illuminance equivalent to a new moon / moonless clear night sky (0.001 lux). Beyond this threshold no impact to light sensitive fauna is assumed. This threshold (0.001 lux) was selected on the basis that fauna undertake nocturnal activities under the natural range of full moon (0.1 lux) to new moon (0.001 lux) without known adverse impacts.

In recognition that the photopic curve is biased towards a human eye response to light, and to remove some of the scientific uncertainty associated with the way light is measured, the 'Potential Impact Area' (i.e., the area relevant for impact assessment of planned light emissions; Table 1-1 conservatively uses an initial luminous intensity value 20% higher than the measured/modelled analogue value. This increase in luminous intensity increases the estimated distance of the Potential Impact Area and provides conservatism to the modelling and subsequent impact assessment.

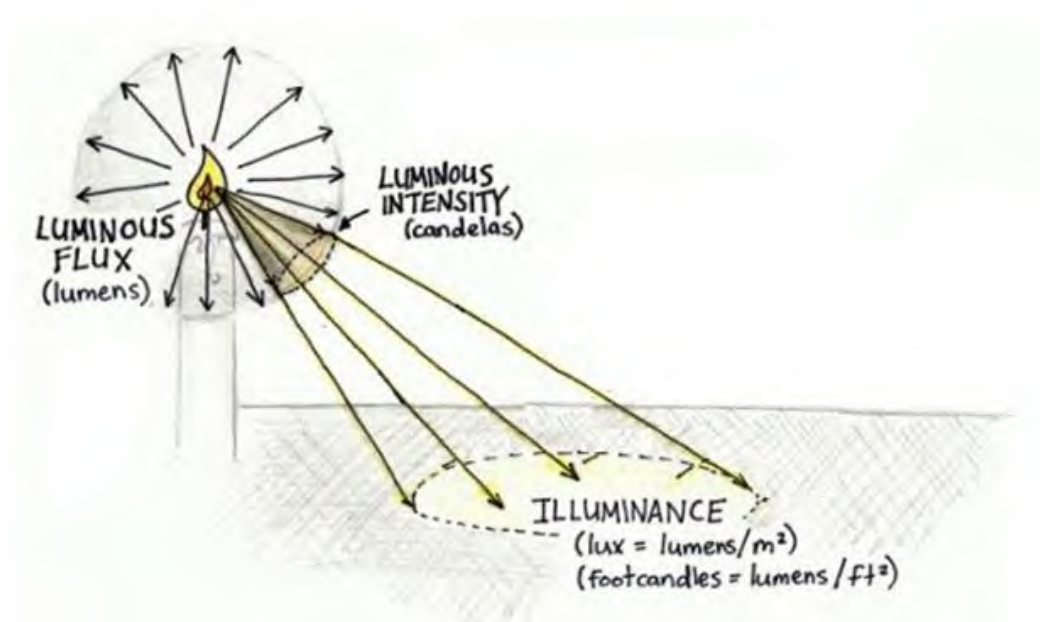


Figure 2-5 Photopic light terminology.



Table 2-2: Summary of natural light illuminance (Environmental Resources Management, 2010).

NATURAL LIGHT SOURCE	LIGHT ILLUMINANCE (LUX)
Direct sunlight	100,00–130,000
Full daylight, indirect sunlight	10,000–20,000
Overcast day	1,000
Very dark day	100
Twilight	10
Deep twilight	1
Full moon	0.1
Quarter moon	0.01
Moonless clear night sky (new moon) ¹	0.001
Moonless overcast night sky	0.0001

¹ Impact threshold utilised in this report is 0.001 lux, beyond this threshold no impact to light sensitive fauna is assumed.



3 VISIBLE LINE OF SIGHT ASSESSMENT

3.1 Methodology

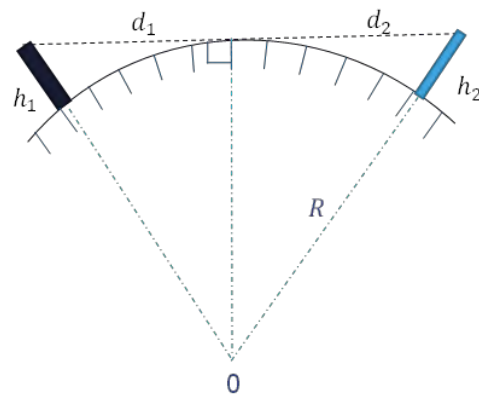
Visible line of sight assessment was conducted using the methodology described in Stallings (2005) for the MODU to determine the worst-case potential extent of visible light for ConocoPhillips. Line of sight and viewshed analysis is typically used in environmental impact assessment for the assessment of impact to visual amenity where an impact may alter a perceived sense of place or inherent value. The visibility of an artificial light does not imply a measurable change in ambient light (and therefore a potential environmental impact), this is estimated through change to illuminance as discussed in Section 4).

Line of sight assessment utilises the following equation to estimate the total line of sight (d):

$$d = \left(\frac{8}{3}Rh_1 + h_1^2\right)^{0.5} + \left(\frac{8}{3}Rh_2 + h_2^2\right)^{0.5}$$

Where

- d = total line of sight ($d_1 + d_2$),
- h_1 = height of object,
- h_2 = height of receptor, and
- R = radius of earth.



The analysis was completed using assumed heights of an analogue MODU for the Exploration Campaign as shown in Table 3-1, with final designs being confirmed during front end engineering (FEED). Receptor heights modelled included a receptor at sea level, and varying elevations (from 5 to 525 m) of the adjacent mainland.

Table 3-1: Assumed heights of the MODU facility infrastructure involved in the Exploration Campaign.

EXPLORATION CAMPAIGN FACILITY INFRASTRUCTURE	HEIGHT OF FACILITY / LIGHTING / FLARE (m) ABOVE SEA LEVEL
Derrick (navigation lights)	85
Deck (working lights)	22
Flare flame height (horizontal boom)	35



3.2 Results and Recommendations

The line-of-sight assessment results for the different heights of the MODU facilities and receptors are outlined in Table 3-2. The assessment shows that at sea level, the maximum distance the tip of the MODU derrick (navigation lights) would be visible above the horizon is 38 km. The flare and equipment above main deck level would be visible from 25 km from the MODU location.

Figure 3-1 and Figure 3-2 show the corresponding areas (extent) of visibility for the MODU derrick (navigation lights) and the deck flare respectively, including the total line of sight distances and the Environment that May Be Affected (EMBA) which is within 20 km for light. Note that exploration drilling is restricted to the petroleum title, therefore the extent of visibility of the rig was based on the operational area within the petroleum title boundary.

The line-of-sight assessment indicates that lights on the derrick and light associated with flaring may be visible as a dot on the horizon from the adjacent mainland, extending inland up to 140 km for elevated receptor locations. However, this line-of-sight distance was estimated without considering the atmospheric interactions/disturbances, and thus is a conservative estimation. Considering the luminance range of human vision, the extent of potential visibility is more likely up to only 49 km when the light intensity reaches 0.001 lux, equivalent to an ambient light intensity level of a moonless clear night sky (which will be shown further in the light intensity (illuminance) Section 4). It is recommended to conduct a Zone of Theoretical Visibility analysis to quantify the visual impact and provide a communication tool to the relevant stakeholders.

King Island is approximately 102 km away from the operational area with a maximum receptor height of 165 m, as such, it is not affected by the light emissions from VIC/P79S (not shown in figures).

Table 3-2: Exploration Campaign facility visual line of sight distances.

EXPLORATION CAMPAIGN INFRASTRUCTURE	HEIGHT OF FACILITY / LIGHTING / FLARE (m)	HEIGHT OF RECEPTOR (m)	TOTAL LINE OF SIGHT (km)
Visibility of MODU infrastructure at sea level			
Derrick (navigation lights)	85	0	38
Flare flame height (horizontal boom)	35	0	25
Deck (working lights)	22	0	19
Visibility of MODU derrick at various receptor heights			
Derrick (navigation lights)	85	5	47
	85	10	51
	85	50	67
	85	100	79
	85	300	109
	85	525	132

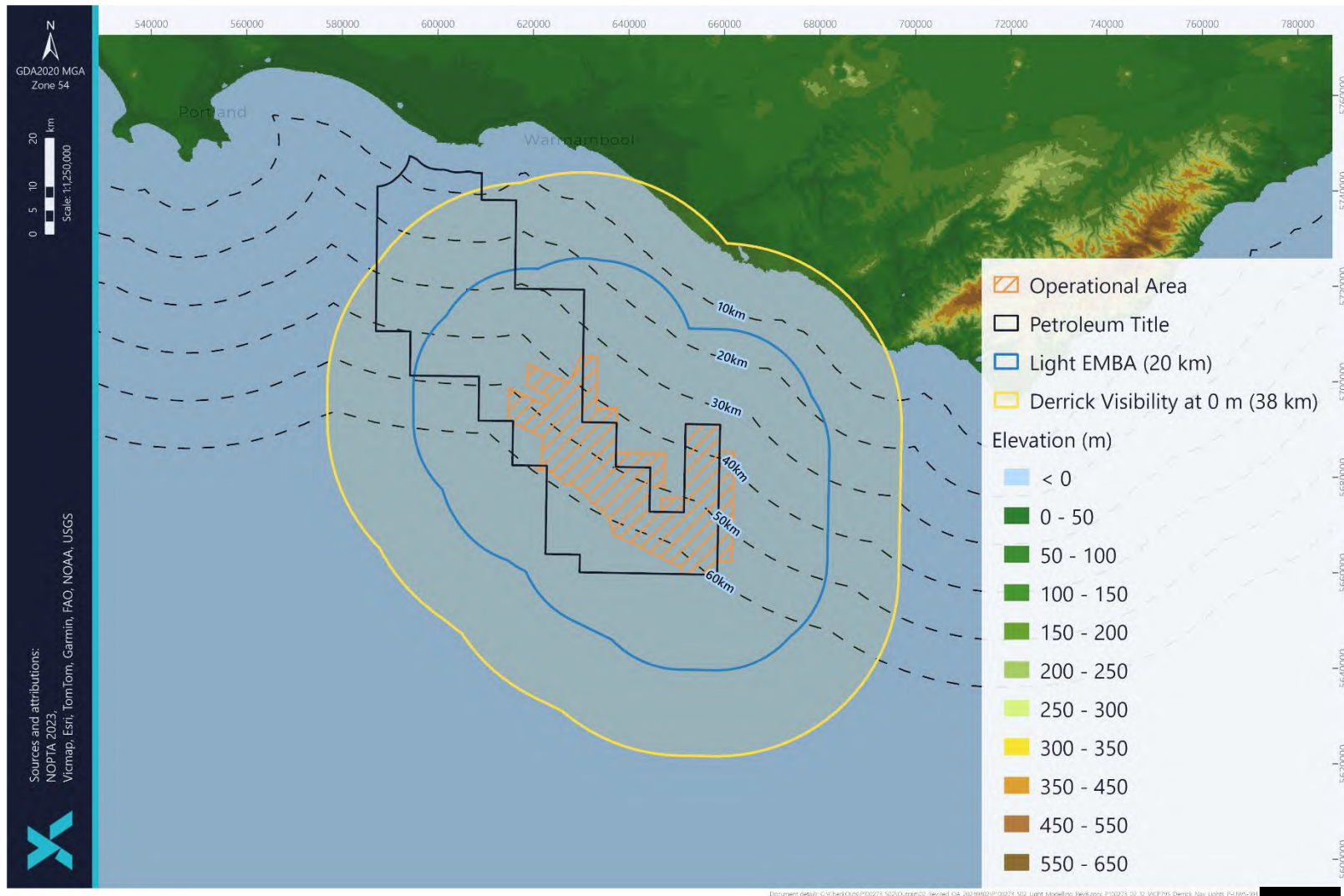


Figure 3-1: Light EMBA and area of visibility (derrick navigation lights).

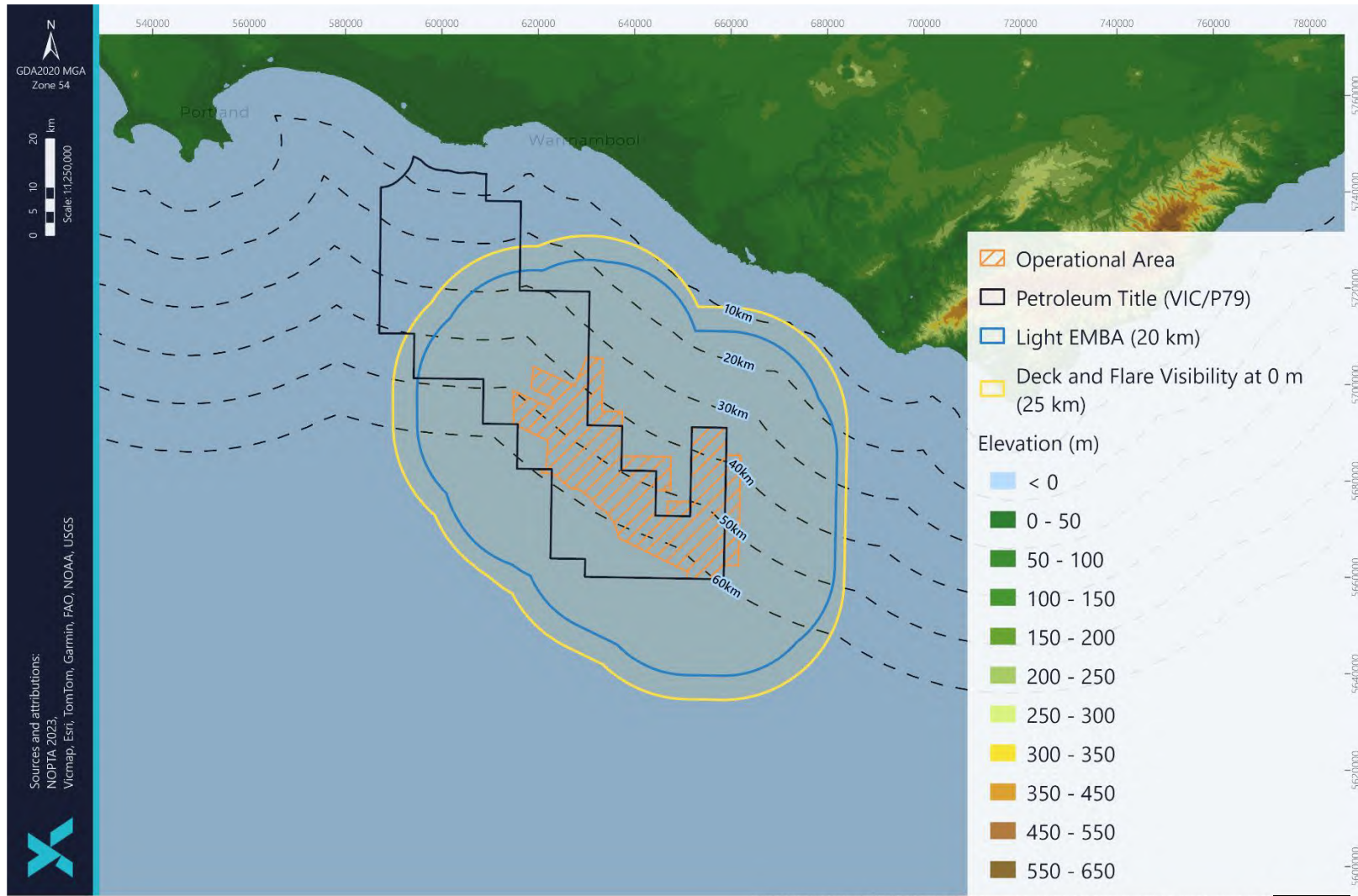


Figure 3-2: Light EMBA and area of visibility (light associated with flaring).



4 LIGHT INTENSITY (ILLUMINANCE) ASSESSMENT

The two sources of artificial lighting (facility and flaring) for the Exploration Campaign were assessed separately, using published modelled and measured data as analogues.

It is noted that most commercial light modelling software requires the input of a number of factors, such as the light fitting type, quantity, and location of light sources – information which is not available at this preliminary stage. As such, the use of analogues was adopted, as this provided a real-world analogue on which to base the artificial light emissions assessment. It is also considered a conservative approach as it does not include any best practice or additional mitigation measures that may be adopted by ConocoPhillips during the FEED of the project.

4.1 Facility Lighting

It is expected that the MODU for the Exploration Campaign will have a similar lit surface area as the drill rig utilised for the Woodside Torosa drilling campaign on Browse reef for which published data is available. The MODU utilised for the Exploration Campaign will be similar with similar lighting required for safe operations of the facility. Therefore the MODU facility light emissions would also be comparable to that of the Torosa wells used during a previous light intensity modelling and associated measured data completed by Environmental Resources Management (2010). Light characteristics and modelling of light sources for the Torosa assessment are based on measured lighting data (lux levels and wavelength) obtained whilst drilling the Torosa South-1 appraisal well on the edge of the South Reef lagoon and ambient data when no activities were occurring at Scott Reef (Environmental Resources Management, 2010). The drill rig used is a suitable analogue for the drill rig expected to be used for the VIC/P79S Exploration Campaign.

The light intensity values derived from the measured Torosa South 1 well campaign were utilised to represent the MODU facility lighting for the Exploration Campaign modelling.

4.2 Flare Light Emissions

The Exploration Campaign will require a MODU flare to dispose of the gas generated from well testing. The gas is produced and flared to allow for testing of the produced gas and oil as well as to calculate the size of the oil and gas reservoir and reservoir characteristics. The excess oil and gas is sent to the flare disposal system to be burnt. The flare for the MODU will be a horizontal boom flare extending out horizontally of the MODU deck. Flaring will occur for a duration of approximately 42 hours per well.

To inform the environmental impact assessment for the Exploration Campaign, light intensity from a flare flow rate of 40 MMscfd was modelled. This represents a peak flaring rate from the well test systems.

Based on Gas Processors Suppliers Association (2004), it has been calculated that this expected rate of flaring will result in a flare flame length of up to approximately 13 m. This flame will generate light. Analogues are utilised to determine the likely amount of light emitted from the flame. This is discussed in Section 4.3.2.



4.3 Methodology

4.3.1 Inverse Law

The light intensity modelling used the inverse square law of illuminance which states that *a doubling of distance results in a reduction in illuminance by four times*, i.e., as a surface that is illuminated by a light source moves away from the light source, the surface appears dimmer. Light emitted becomes dimmer in an inverse square relationship to distance as represented in Figure 4-1 and in the mathematical equation below:

$$E = \frac{I}{D^2}$$

Where

- E = illuminance (in lux),
- I = luminous intensity (in candela), and
- D = the distance from the light source in meters.

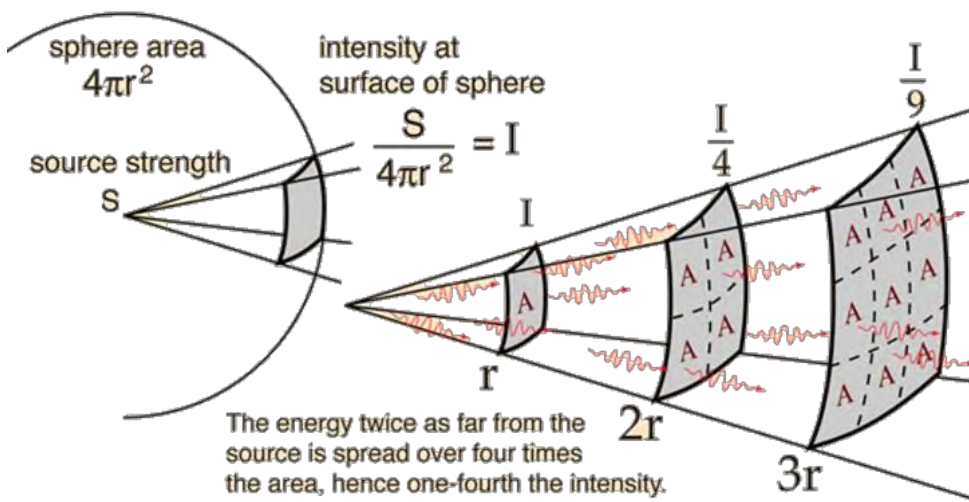


Figure 4-1: Inverse square law.



4.3.2 Analogues

As flares are not designed to be luminous, there is some uncertainty in calculating luminous intensity from a flare. To reduce the uncertainty, light measurements from an analogue, existing flares have been utilised to calculate likely light emissions from the flare. These analogues are documented within publicly available literature on light emissions from flares.

The analogues for gas flares were identified and are detailed in Table 4-1.

Table 4-1: Details of potential analogue natural gas flares.

ANALOGUE SITE	FACILITY TYPE	FLARE RATE	LUMINANCE INTENSITY	ILLUMINANCE METHOD	REFERENCE
Galoc FPSO – Philippines	Tamarind operated FPSO oil facility: Continuous gas flare	~15 MMscfd, 18–20 m high flame	Not specified	N/A (Flame height provided only)	Tamarind (2019)
Wheatstone LNG Plant – Onslow, WA	Chevron-operated onshore LNG facility: Safety flare	Not specified	Not specified	Modelled Illuminance (lux)	URS Australia (2010)
Narrabri Gas Project – Bibblewindi, NSW	Proposed Santos-operated onshore gas production facility: Safety flare	244 MMscfd, 30 m high flame	Not specified	Modelled Illuminance (lux) based on measured and calculated source data	Imbricata Environmental (2018)
Obigbo Oil Production Facility – Nigeria	Shell-operated oil production facility: Continuous flaring of associated gas	30 MMscfd	~1,805,000 cd	Measured Illuminance (lux)	Isichei and Sanford (1976) Nwaobi (2005) European Commission (2014)

The four analogues were compared to the expected flare characteristics (rates, flame heights) for the Exploration Campaign to determine if they were appropriate for use in this light emissions assessment.

The Galoc FPSO has a continuous flare which operates at a flare rate of ~15 MMscfd. However, it has not had light intensity levels or illuminance levels measured or modelled and is therefore not considered further within this light intensity assessment.



The Wheatstone LNG flare has modelled illuminance information, but no details on flare rate are publicly available. As this information is unknown, the Wheatstone LNG flare was not carried through to the next stage of assessment as a potential analogue.

Despite the similar flame height (30 m for Narrabri compared to the 22 m from the Exploration Campaign MODU), the Narrabri gas flare rate is >200 MMscfd, which is an order of magnitude higher than that for the Exploration Campaign, and as such was not considered an appropriate analogue and is not discussed further in this assessment.

The Obigbo facility has a continuous flare that is of similar scale and has a flare rate (30 MMscfd) close to the rate expected for the Exploration Campaign (40 MMscfd). For these reasons, the Obigbo oil production facility was considered an appropriate analogue for the MODU flare. A detailed study describing lux levels at varying distances from the operational flare was also available for the Obigbo oil production facility (Isichei and Sanford, 1976). The detail provided in that study, as well as Nwaob (2005) and European Commission (2014) allow for the characteristics of the Obigbo flare to be scaled and for characterisation of other flares. This data provides the basis for the following flare light intensity modelling.

4.3.3 Model

The light intensity model was built in Microsoft Excel utilising the inverse law of illumination (Section 4.3.1). The following assumptions were made.

- Obigbo oil production facility flare characteristics as stated in Table 4-1,
- Combustion characteristics of the Exploration Campaign flare are similar to Obigbo,
- No allowance was made for atmospheric or topographic interactions including shadowing, absorption or scattering, as such the model is conservative and likely to overestimate illuminance at distance,
- Flare luminous intensity is calculated directly proportional to flare flow rate, and
- Facility luminous intensity is combined with the flare luminous intensity as a total luminous intensity input into the model.

Illuminance was calculated every 100 m from the flare source (in lux), and results overlaid in geographic information system (GIS) to identify geospatial contours.

A verification exercise of the Xodus Group light decay model (Xodus model) was conducted using the light decay model developed by Jacobs–SKM for the Browse FLNG Draft Environmental Impact Statement (Jacobs–SKM, 2014). The verification exercise for the Xodus model plotted the Xodus Group light decay model expected illuminance for the Browse Development against the Jacobs–SKM modelled illuminance. The Xodus model predicted illumination levels aligned with the Jacobs–SKM model, verifying the Xodus model outcomes.



4.4 Results and Recommendations

The results of the light intensity modelling are summarised in Table 4-2 and are also shown graphically for the Exploration Campaign in Figure 4-2 to Figure 4-5. Note that for Figure 4-2, the exploration drilling is restricted to the petroleum title, therefore the extent of visibility of the rig was based on the operational area within the petroleum title boundary.

Table 4-2: Illuminance modelling results and Obigbo analogue.

SITE/SCENARIO	FLARE LUMINANCE INTENSITY (CD)	LIGHT ILLUMINANCE (LUX)						
		Distance from Facility (km)						
		0.5 km	1 km	5 km	10 km	20 km	30 km	60 km
Analogue Case								
Obigbo Facility – Nigeria	~1,805,000	7.2	1.8	0.072	0.018	0.004	0.002	< 0.002
Modelled Cases								
Exploration Campaign facility lighting from the MODU	~100,000	0.4	0.1	0.004	0.001	0.0002	<0.0001	<0.0001
Exploration Campaign combined facility lighting and flaring from the MODU (40 MMscfd)	~ 2,495,667	10.0	2.5	0.100	0.025	0.006	0.003	0.0007

For the Exploration Campaign, the model predicted the following for the combined facility lighting and flaring rate of 40 MMscfd during flaring (Figure 4-2 and Figure 4-3):

- Light intensity levels greater than 0.1 lux are predicted to occur up to 5 km from the MODU, comparable to ambient light levels during full moon to twilight.
- Between 5 km and 16 km from the MODU, the model predicted light intensity levels comparable to ambient light levels during a quarter moon to full moon night sky (0.01 lux to 0.1 lux).
- Between 16 km and 49 km, light intensity levels were predicted to be between 0.01 lux and 0.001 lux, which is comparable to ambient light intensity levels between a moonless clear night sky and a quarter moon.
- Beyond 49 km, there was no measurable change to the ambient light intensity levels.

For the Exploration Campaign, the model predicted the following for the facility lighting when not flaring (Figure 4-4 and Figure 4-5):

- Light intensity levels greater than 0.1 lux are predicted to occur up to 1 km from the MODU, comparable to ambient light levels during full moon to twilight.
- Between 1 km and 3 km from the MODU, the model predicted light intensity levels comparable to ambient light levels during a quarter moon to full moon night sky (0.01 lux to 0.1 lux).
- Between 3 km and 9 km, light intensity levels were predicted to be between 0.01 lux and 0.001 lux, which is comparable to ambient light intensity levels between a moonless clear night sky and a quarter moon.
- Beyond 9 km, there was no measurable change to the ambient light intensity levels.

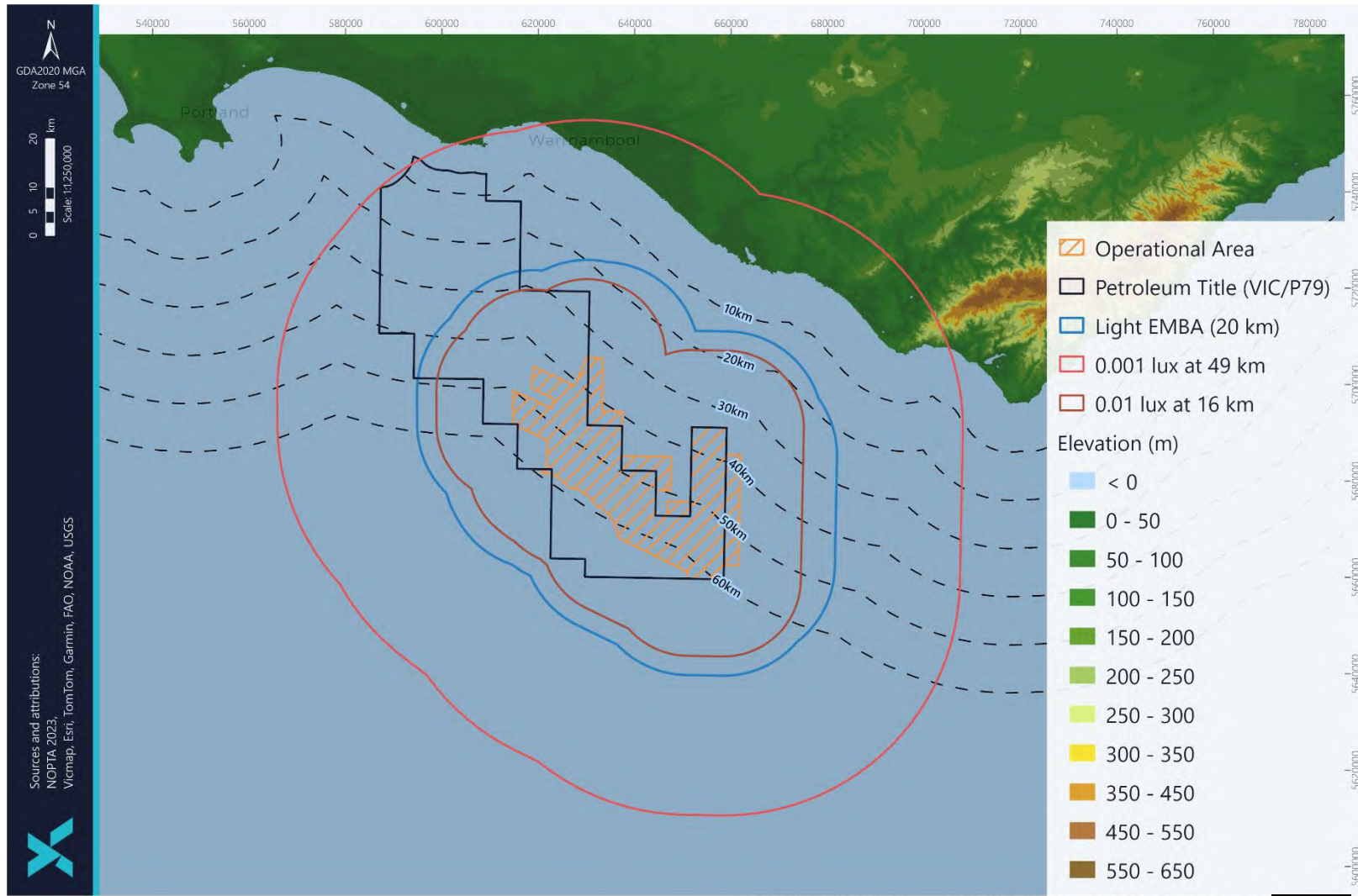


Figure 4-2: Map of expected light intensity (illuminance) levels from flare and facility lighting on the MODU during flaring (40 MMscfd).

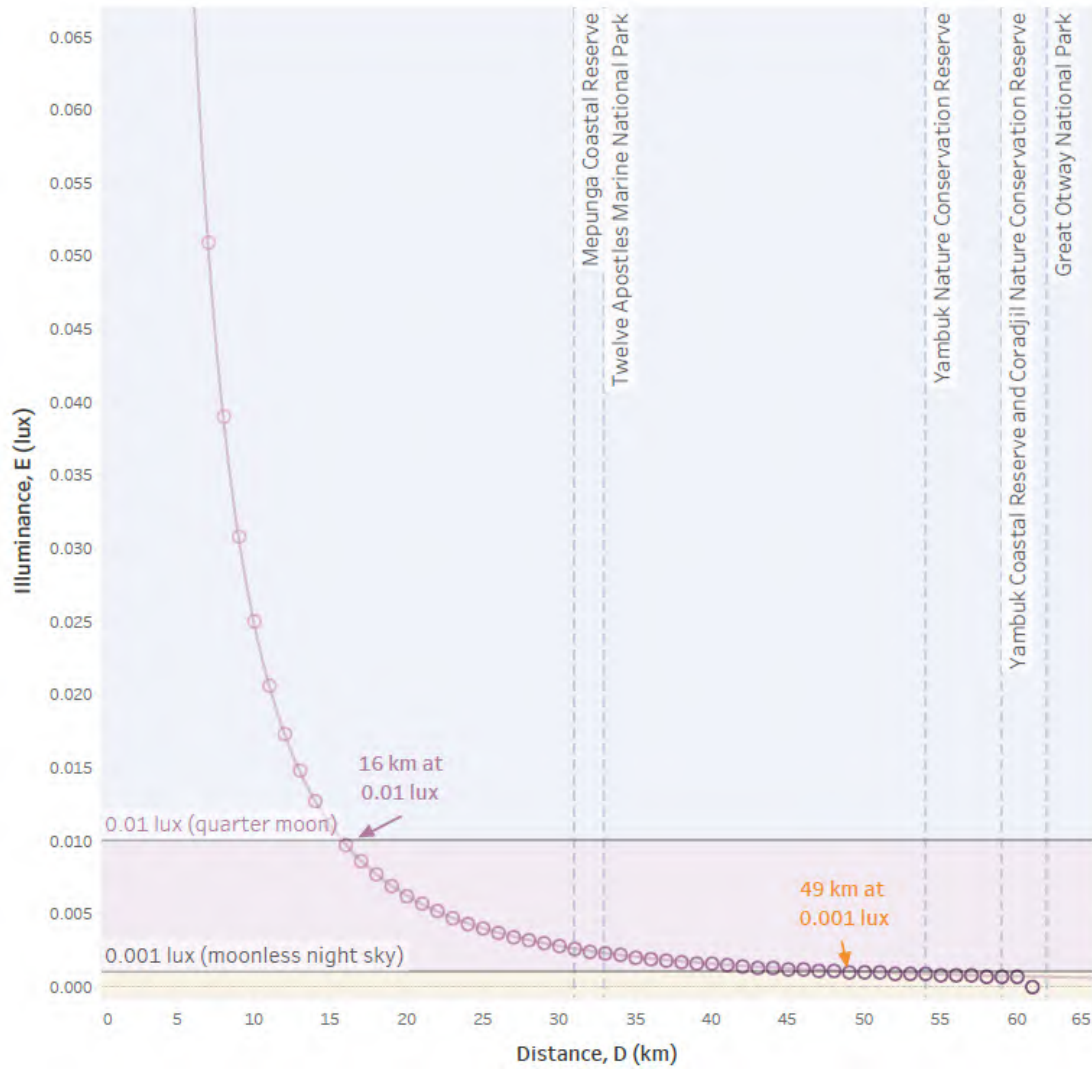


Figure 4-3: Expected light intensity levels from flare and facility lighting on the MODU during flaring (40 MMscfd) at receptor locations.

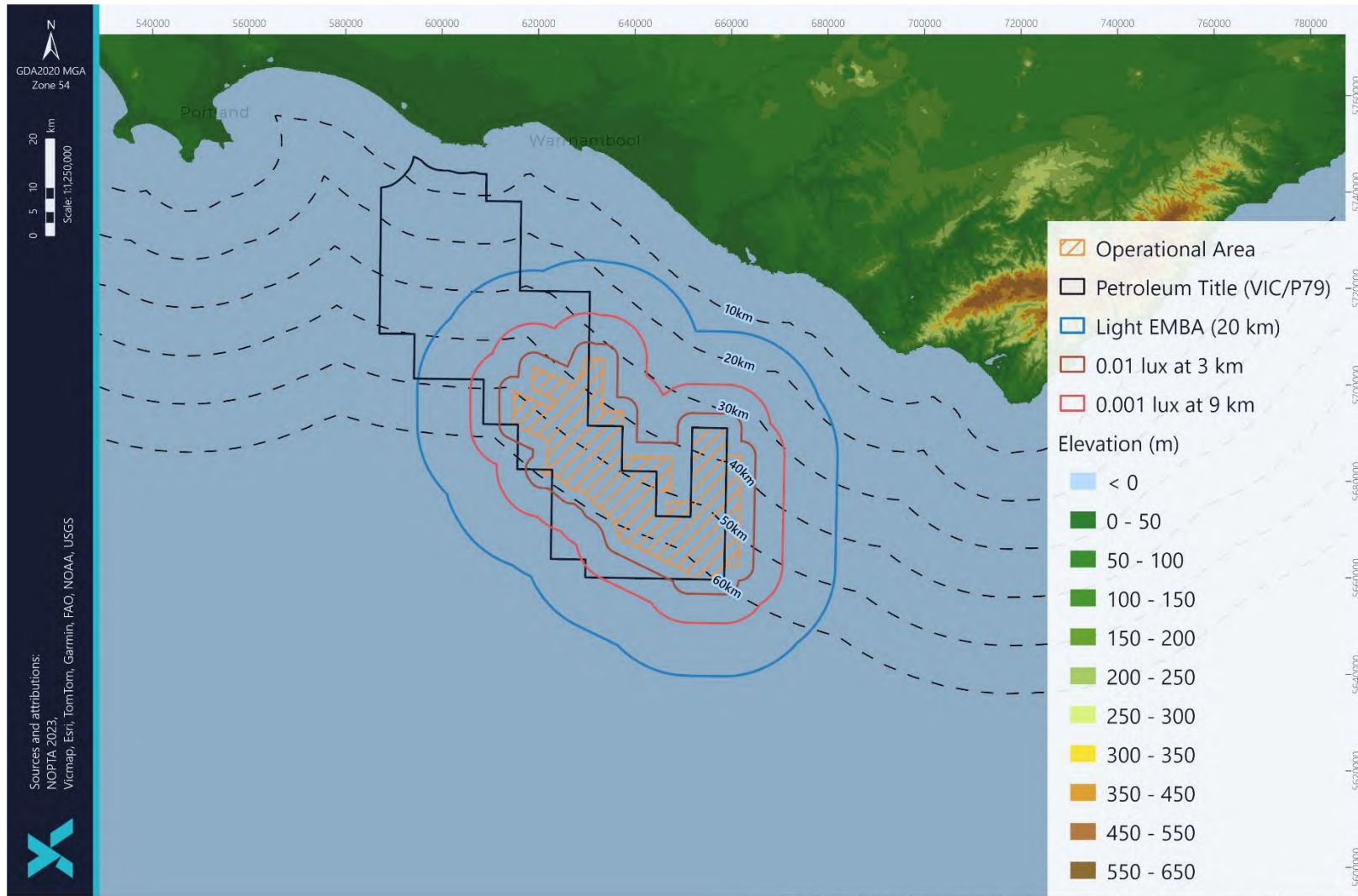


Figure 4-4: Map of expected light intensity (illuminance) levels from facility lighting on the MODU, when not flaring.

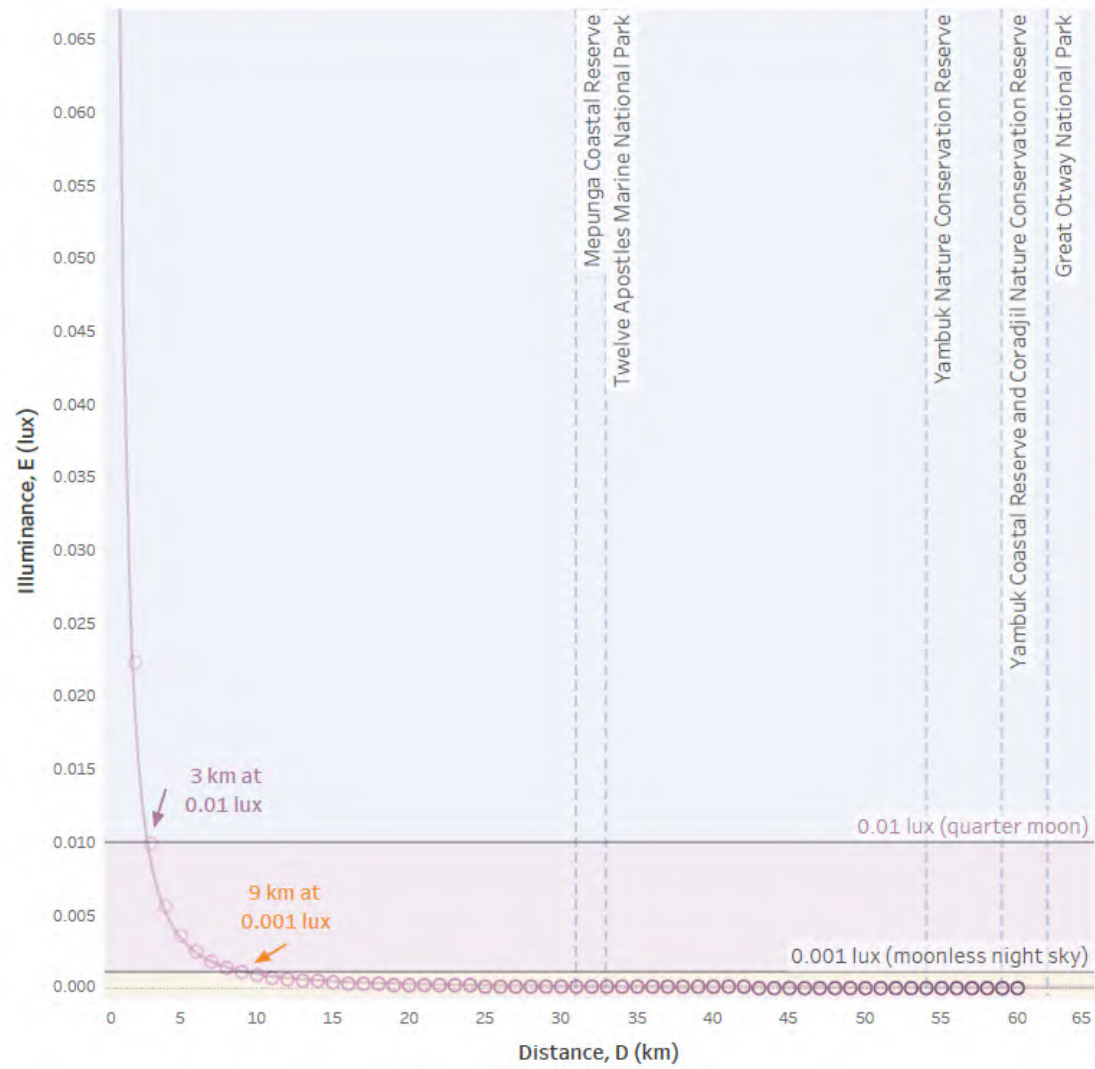


Figure 4-5: Expected light intensity levels from facility lighting on the MODU at receptor locations when not flaring.



As noted in Section 2.2, in recognition that photometric measurements are biased towards the human eye response to light, the spatial extent potentially impacted by visible light from the MODU, as a visible dot on the horizon, is out to a distance of 9 km from the position of the MODU when not flaring (Figure 4-4 and figure 4-5). Note: This is distinct from the biological light EMBA which is relevant for the potential assessment of impacts to, for example, birds.

The spatial extent potentially impacted by visible light from flaring and MODU lighting, as a visible dot on the horizon, is out to a distance of 49 km from the position of the MODU (Figures 4-2 and 4-3).

As shown in the light intensity results (Figure 4-3 and figure 4-5), the light intensity levels of the MODU structure received at the selected receptor locations of Twelve Mepunga Coastal Reserve (31 km) and Apostles Marine National Park (33 km) are comparable to the ambient light levels less than a quarter moon (0.01 lux) when flaring and less than a moonless clear night sky (0.001 lux) when not flaring, equivalent to the 'First Quarter' and 'New' moon phases in Figure 4-6, respectively.

For other selected receptor locations – Yambuk Nature Conservation Reserve (54 km), Yambuk Coastal Reserve (59 km), Coradjil Nature Conservation Reserve (59 km), Great Otway National Park (62 km), and the nearby towns, the light intensity levels are comparable to the ambient light levels less than a moonless clear night sky (0.001 lux) both when flaring and when not flaring.



Figure 4-6: The moon phases. Credit: NASA/Bill Dunford (Johnston, 2020).



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ConocoPhillips Australia

T/49P Otway Drilling Campaign

T/49P Light Emissions and Line of Sight Modelling

ASSIGNMENT P100273-S00
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1 INTRODUCTION

1.1 Project Overview

The Otway Exploration Drilling Campaign is located within Commonwealth waters in the Bass Strait in an area centred approximately 37.9 km offshore Victoria (VIC) and approximately 31 km west of King Island as pictured in Figure 1-1. The field lies in approximately 90-120 m of water within permit T/49P. ConocoPhillips Australia plan to execute an exploration well drilling campaign within T/49P. This campaign is referred to as the Exploration Campaign throughout the rest of this document. This report presents the light modelling study for the Campaign within T/49P.

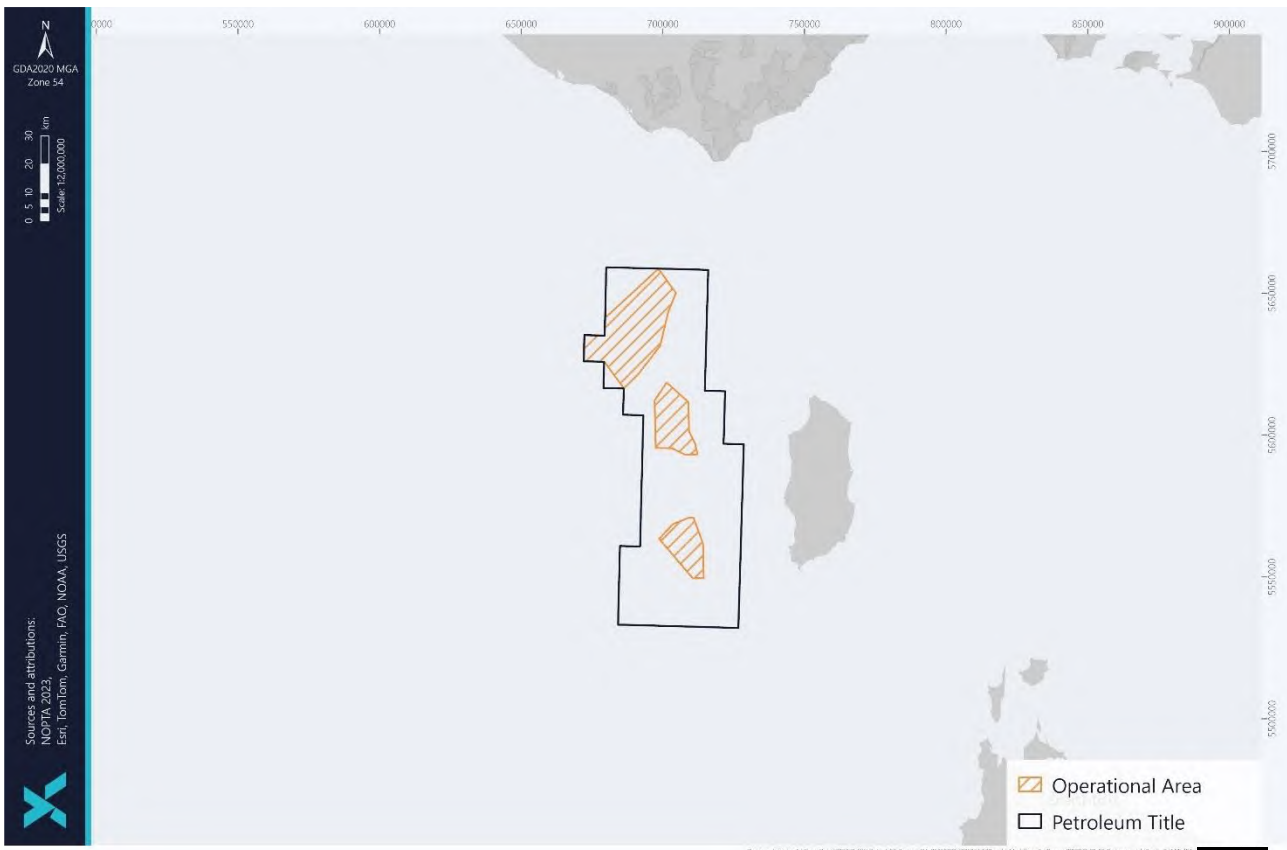


Figure 1-1 Otway drilling light modelling scope for T/49P

1.2 Objective

The purpose of this technical note is to present the outcomes of the assessment undertaken to estimate the artificial light emissions from the Exploration Campaign. This study assessed distances from the considered operations to the physical equipment, lights and flaring from the mobile offshore drilling unit would be visible and where light levels from facility lighting and well test flaring reached thresholds corresponding to various natural light levels.



1.3 Scope

The operations of the mobile offshore drilling unit (MODU) and associated facilities and activities of the Exploration Campaign will require the physical presence of a MODU and generate artificial light emissions. The source of these emissions includes:

- external facility lighting on vessels and Mobile Offshore Drilling Unit (MODU) for safe navigation and working conditions
- flaring of excess associated gas will be from a horizontal boom flare and will occur up to approximately 100 hours per well.

Both sources of light emissions are quantified and discussed in this technical note. The exact well locations are yet to be determined therefore all potential locations were considered for modelling (Figure 1-1).

The assessment included two sets of modelling:

- visible line of sight estimates
- light intensity (illuminance) modelling.

Light intensity modelling has been used as an indication of the measurable change in ambient light conditions, while line of sight estimates have been used as an indication of the distance that the facility and its lights may be visible. These quantifications have been used to develop two types of area used for subsequent environmental impact analysis (Table 1-1).

The modelling utilises the MODU as the basis for modelling as it will be the largest and tallest piece of infrastructure that will be infield for the Exploration Campaign. The light intensity modelling utilises the two major sources of light emissions as the basis for the model, the MODU lighting and flaring from the MODU for well testing. Artificial light emissions from vessels (e.g., support vessels, export tankers) associated with the Exploration Campaign were not included in the assessment due to their much smaller scale and/or temporary and transient nature.

Table 1-1 Predicted artificial light exposure and impact areas for the Exploration Campaign

ARTIFICIAL LIGHT ASSESSMENT AREAS	DESCRIPTION
<p>Visible Light Exposure Area</p>	<p>The spatial extent of visible light that is predicted to occur from the Exploration Campaign. The threshold for this area is whether any part of the facility is visible as a dot on the horizon.</p>
<p>Potential Impact Area</p>	<p>The spatial extent of a measurable change in ambient light that is predicted to occur from the Exploration Campaign. The threshold for this area is an illuminance equivalent to ambient light on a moonless clear night sky/new moon (<0.001 lux). This is the area relevant to the impact assessment for planned light emissions from the Exploration Campaign.</p>



2 LIGHT

2.1 Definition

Light is a form of energy that is emitted over a particular band of frequencies and wavelengths of the electromagnetic spectrum, and includes ultraviolet, visible (to humans) light and infrared light. The visible range for humans is approximately 400–700 nm. Fauna perceive light differently to humans, and their visible spectrum can vary between ~300 nm and >700 nm depending on the species (CoA 2023).

Humans and fauna use photoreceptor cells (cones and rods) in the eye to detect light. Photopic vision, which occurs in bright conditions, activates the cones and allow the eye to see colour. Scotopic vision, which occurs in low light conditions, activates rods and allow the eye to see in shades of grey. Scotopic vision is more sensitive to shorter wavelength light than photopic visions (CoA 2023). Nocturnal species rely on scotopic vision and can therefore be sensitive to changes in light at this this high energy short wavelength end of the spectrum (i.e., ultraviolet/violet/blue light).

2.2 Measurement

Radiometry is the detection and measurement of electromagnetic radiation. With respect to optics, radiometry refers to the detection and measurement of radiant energy within the light (ultraviolet, violet, infrared) portion of the electromagnetic spectrum. Photometry is a subset of radiometry that applies to the visible light spectrum and measured values are also weighted to the typical response of a human eye. As humans and fauna perceive light differently, radiometric measurements are more biologically relevant, as they account for the energy emitted across all light wavelengths (CoA 2023). Common quantities used to describe light in radiometric and photometric terms are provided in Table 2-1.

Table 2-1 Typical radiometric and photometric quantities

RADIOMETRIC			PHOTOMETRIC		
Quantity	Symbol	Units	Quantity	Symbol	Units
Radiant power	Φ_E	W	Luminous flux	Φ_V	lm
Radiant intensity	I_E	W/sr	Luminous intensity	I_V	lm/sr (or cd)
Irradiance	E_E	W/m ²	Illuminance	E_V	lm/m ² (or lux)
Radiance	L_E	W/m ² sr	Luminance	L_V	lm/m ² sr

E = energetic; *V* = visual; *W* = watt; *sr* = steradian; *lm* = lumen; *cd* = candela



The conversion between radiometric and photometric units is dependent on the photopic spectral luminous efficiency function, $V(\lambda)$, as defined by the Commission International de l'Eclairage (CIE) in 1924, and the spectral radiant power curve, $\Phi_E(\lambda)$, of the light source. The conversion is provided by the following relationship:

$$\Phi_V = K_m \int_{\lambda=380}^{\lambda=830} \Phi_E(\lambda) V(\lambda) \delta\lambda$$

Where:

- Φ_V is the luminous flux (lumens)
- K_m is a scaling factor equivalent to 683 lm/W
- $\Phi_E(\lambda)$ is the spectral radiant power (W/nm)
- $V(\lambda)$ is the photopic spectral luminous efficiency function.

The photopic spectral luminous efficiency function, $V(\lambda)$, is a function of wavelength and relates to how a human eye responds to that wavelength of light. In humans the photoreceptor cells are more responsive to green/yellow wavelength light compared to red or violet. $V(\lambda)$ can be approximated by the following non-linear regression:

$$V(\lambda) = 1.019e^{-285.4(\lambda-0.559)^2}$$

Empirical data shows that the function has a maximum value at a wavelength of 555 nm (Figure 2-1), which is the wavelength at which the human eye is most responsive. Spectral luminous efficiency varies across different animal species this is discussed further in Section 2.3.

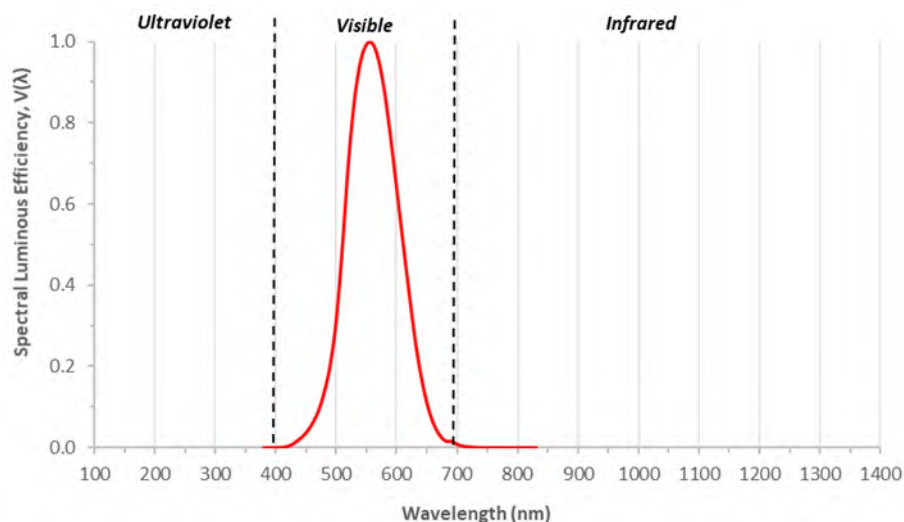
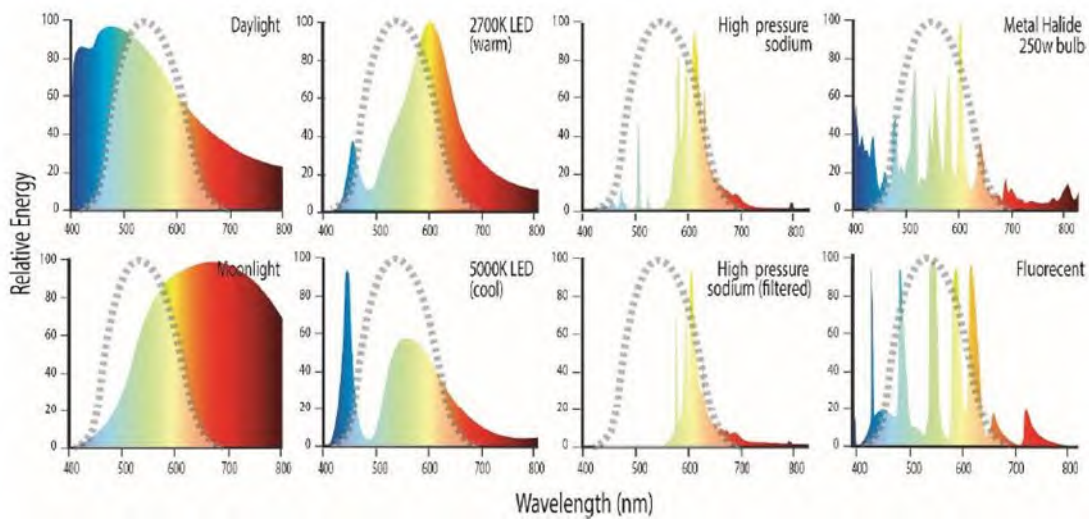


Figure 2-1 Spectral luminous efficiency function



The spectral radiant power of a light source is also related to wavelength, however, will also change depending on the type of light (Figure 2-2, Figure 2-3). The significance of a spectral power curve becomes apparent when using a photometric measurement to describe light for a source that is, for example, high in blue light emissions (such as cool LED or metal halide; Figure 2-2) or high in infrared emissions (such as a gas flare; Figure 2-3) as a photopic measurement may be underestimating the amount of light present as the photopic curve puts a higher weighting on light emitted in the green/yellow range compared to the blue or red (Figure 2-1).



(Source:

(CoA 2023)

Figure 2-2 Relative spectral radiant power curves for common natural and artificial light sources (shown in colour) with photopic response curve (grey dashed line)

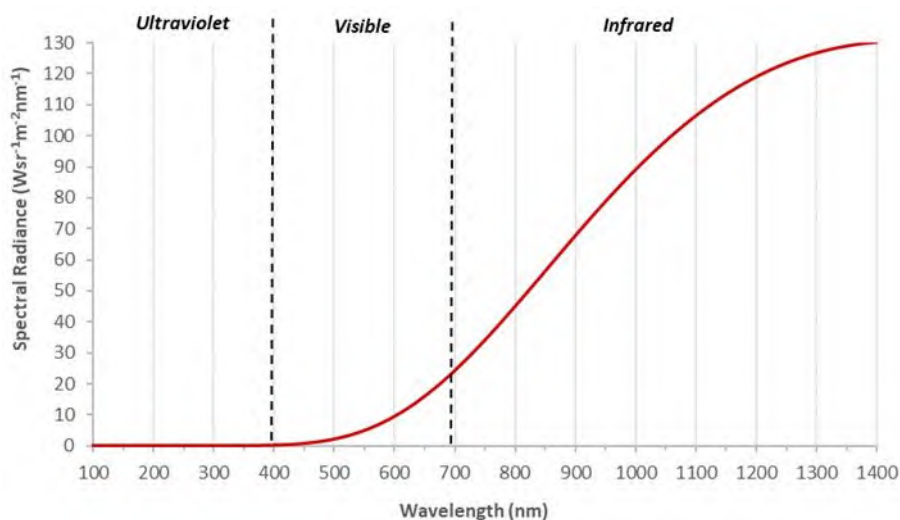


Figure 2-3 Predicted spectral radiance curve for a natural gas flare (based on 2,000 K blackbody emission)



2.3 Artificial Light Assessment

To date, light monitoring equipment has predominantly used photopic measurements. Few light measurement techniques that are appropriate for capturing biologically relevant light and are commercially available exist (Table 1 in CoA 2023). As described in Section 2.2, due to the photopic spectral luminous efficiency function being based on a human eye response, there is lower sensitivity in photometric measurements to shorter wavelength light (ultraviolet, violet, blue) that is important to nocturnally active marine fauna. However, as noted within the National Light Pollution Guidelines (CoA 2023), photometric measures can be used in impact assessment on wildlife, but limitations should be acknowledged and considered.

For the light intensity (illuminance) modelling component of the artificial light emissions assessment for the Exploration Campaign (refer to Section 1), photometric measurements have been used. This decision was based on the type of published measured light data that was available to identify analogues and to use as input to the light modelling calculations.

Photometric light can be described in terms of luminous flux, luminous intensity and illuminance:

- luminous flux is a measure of the amount of light from a source emitted in total regardless of direction (unit of measurement: lumens)
- luminous intensity is the amount of light emitted in a particular direction; the direction is typically stated in steradians (unit of measurement: candelas)
- illuminance is the amount of light reaching an area (unit of measurement: lux; where 1 lux is equivalent to 1 lumen/m²).

These terms are graphically depicted in Figure 2-4.

Illuminance (also referred to as light intensity) is the term of interest for environmental impact assessment for the ConocoPhillips Australia.

Typical light illuminance values from natural light sources are described in Table 2-2 and these are considered representative of ambient light levels in the vicinity of the Exploration Campaign in Victoria and King Island.

There are currently no published or accepted thresholds at which artificial light may impact fauna. Consequently, the minimum threshold used to describe a change in ambient light conditions within this artificial light assessment is an illuminance equivalent to a new moon / moonless clear night sky (0.001 lux), beyond this threshold no impact to light sensitive fauna is assumed. This threshold (0.001 lux) was selected on the basis that fauna undertake nocturnal activities under the natural range of full moon (0.1 lux) to new moon (0.001 lux) without known adverse impacts.

In recognition that the photopic curve is biased towards a human eye response to light, and to remove some of the scientific uncertainty associated with the way light is measured, a Potential Impact Area (i.e., the area relevant for impact assessment of planned light emissions; Table 1-1) has been defined. This Potential Impact Area conservatively uses an initial luminous intensity value 20% higher than the measured/modelled analogue value. This additional distance provides a layer of conservatism to the modelling and subsequent impact assessment.

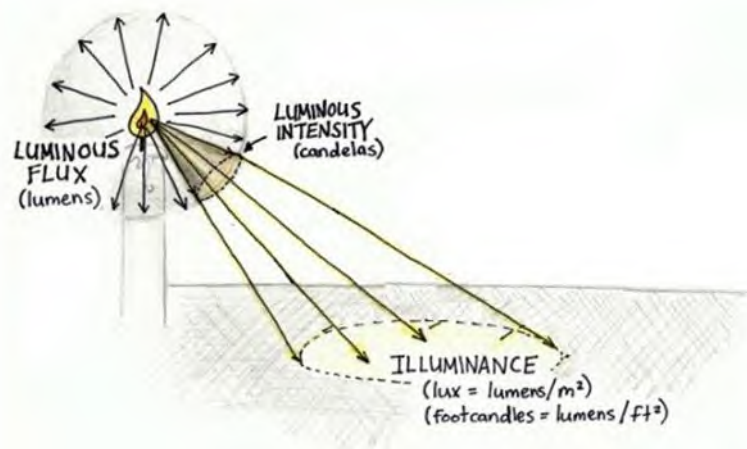


Figure 2-4 Photopic light terminology

Table 2-2 Summary of natural light illuminance

NATURAL LIGHT SOURCE	LIGHT ILLUMINANCE (LUX)
Direct sunlight	100,00–130,000
Full daylight, indirect sunlight	10,000–20,000
Overcast day	1,000
Very dark day	100
Twilight	10
Deep twilight	1
Full moon	0.1
Quarter moon	0.01
Moonless clear night sky (new moon) ¹	0.001
Moonless overcast night sky	0.0001

(Source: ERM 2010)

¹ Impact threshold utilised in this report is 0.001 lux, beyond this threshold no impact to light sensitive fauna is assumed.



3 VISIBLE LINE OF SIGHT ASSESSMENT

3.1 Method

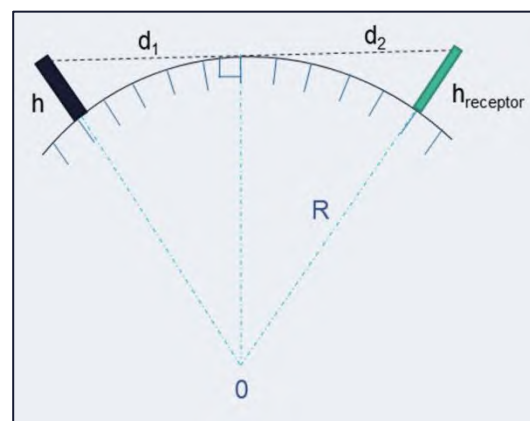
A line-of-sight analysis was conducted using the methodology described in Stallings (2014) for the MODU to determine the worst-case potential extent of visible light for the ConocoPhillips Australia. Line of sight and viewshed analysis is typically used in environmental impact assessment for the assessment of impact to visual amenity where an impact may alter a perceived sense of place or inherent value. The visibility of an artificial light does not imply a measurable change in ambient light (and therefore a potential environmental impact), this is estimated through change to illuminance as discussed in Section 1).

Line of sight calculations utilised the following method:

$$d = \left(\frac{8}{3} R h_1 + h_1^2 \right)^{0.5} + \left(\frac{8}{3} R h_2 + h_2^2 \right)^{0.5}$$

Where

- h_1 = height of object
- h_2 = height of receptor
- R = radius of earth
- d = total line of sight ($d_1 + d_2$)



The analysis was completed using assumed heights of an analogue MODU for the Exploration Campaign, with final designs being confirmed during front end engineering (FEED) (Table 3-1). Receptor heights modelled included the highest point on King Island (165m above sea level) as well as a receptor at sea level.



Table 3-1 Exploration Campaign facility infrastructure and receptor heights

EXPLORATION CAMPAIGN FACILITY INFRASTRUCTURE	HEIGHT OF RECEPTOR (M) ABOVE SEA LEVEL	HEIGHT OF FACILITY / LIGHTING / FLARE (M) ABOVE SEA LEVEL
Receptor at King Island (highest point)		
Derrick (navigation lights)	165	85
Flare flame height (horizontal boom)	165	35
Deck (working lights)	165	22
Receptor at Sea Level		
Derrick (navigation lights)	0	85
Flare flame height (horizontal boom)	0	35
Deck (working lights)	0	22

3.2 Results and Recommendations

The line-of-sight assessment results for the different heights of the MODU facilities and receptors is outlined in Table 3-2.

The line-of-sight assessment shows that at sea level the maximum distance the tip of the MODU derrick (navigation lights) would be visible above the horizon was 38 km (Figure 3-1). The flare and equipment above main deck level would be visible from 25 km from the MODU location (Figure 3-2).

From the maximum height of King Island, the tip of the MODU derrick (navigation lights) would be visible above the horizon when the MODU was up to 91 km from King Island. The flare and equipment above deck level would be visible when the MODU was up to 77 km from King Island.

The line-of-sight assessment indicates that the MODU will be visible as a small object or light on the horizon from King Island and to a lesser extent Great Otway National Park during the drilling campaign (Table 3-2, Figure 3-1 and Figure 3-2)². It is likely that flaring will be visible at elevated locations on King Island and Great Otway National Park.

² The expected position (including the 2 km buffer around the potential drill locations) of the MODU has been accounted for in the development of the Visible Light Exposure Area, with the respective distances being measured from the entire alignment along which the MODU may move instead of a single point.



It is recommended that a view shed analysis of the MODU structure be completed to quantify the visual impact and provide a communication tool to stakeholders of King Island and Great Otway National Park.

Table 3-2 Exploration Campaign facility visual line of sight distances

EXPLORATION CAMPAIGN INFRASTRUCTURE	HEIGHT OF RECEPTOR (m)	HEIGHT OF FACILITY / LIGHTING / FLARE (m)	VISIBLE RADIUS - LINE OF SIGHT ANALYSIS (km)
Receptor King Island (highest point)			
Deck (working lights)	165	22	72
Derrick (navigation lights)	165	85	91
Flare flame height (horizontal boom)	165	35	77
Receptor Sea Level			
Deck (working lights)	0	22	19
Derrick (navigation lights)	0	85	38
Flare flame height (horizontal boom)	0	35	25

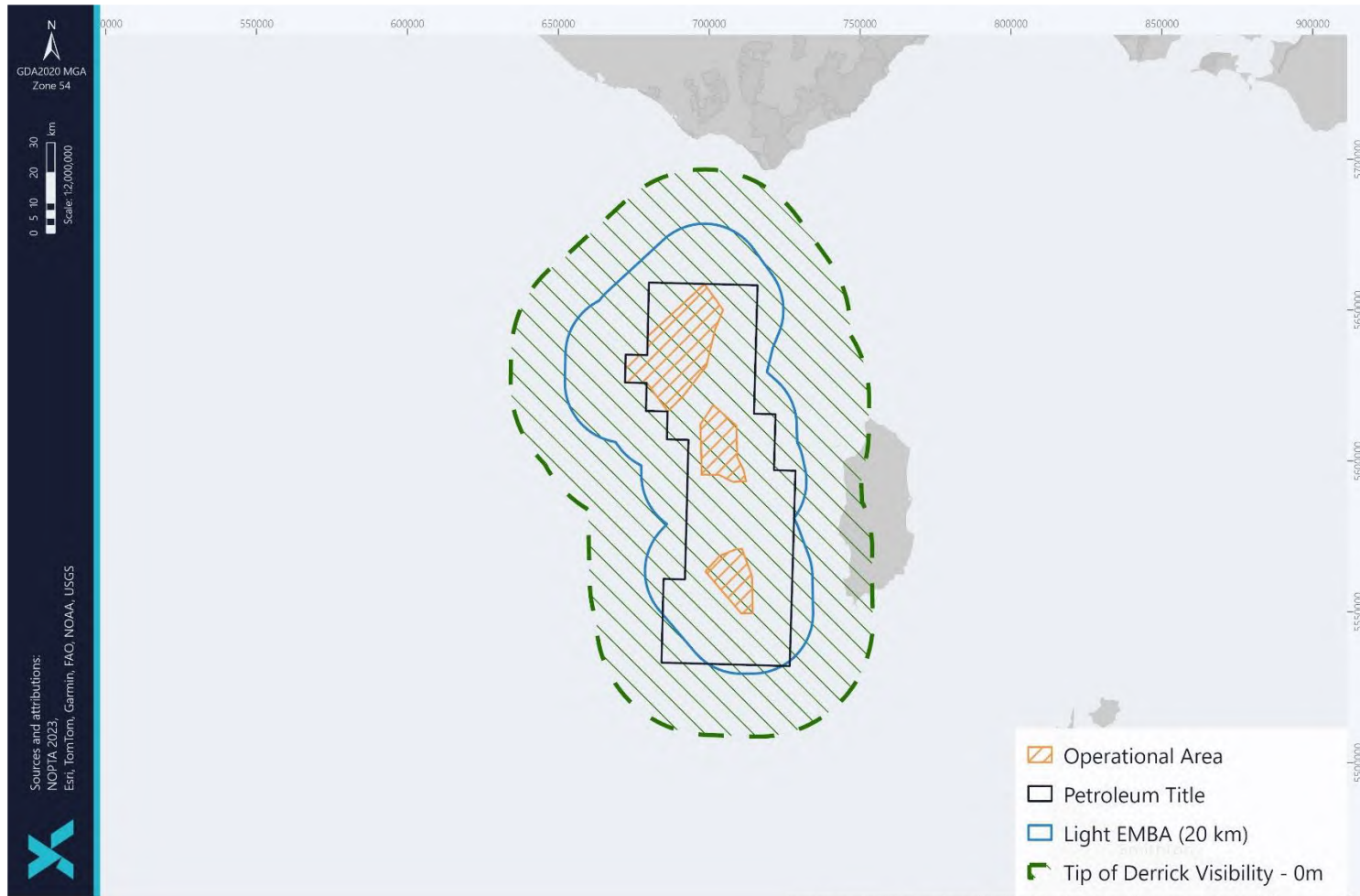


Figure 3-1 Area of visibility (Derrick, 38 km)

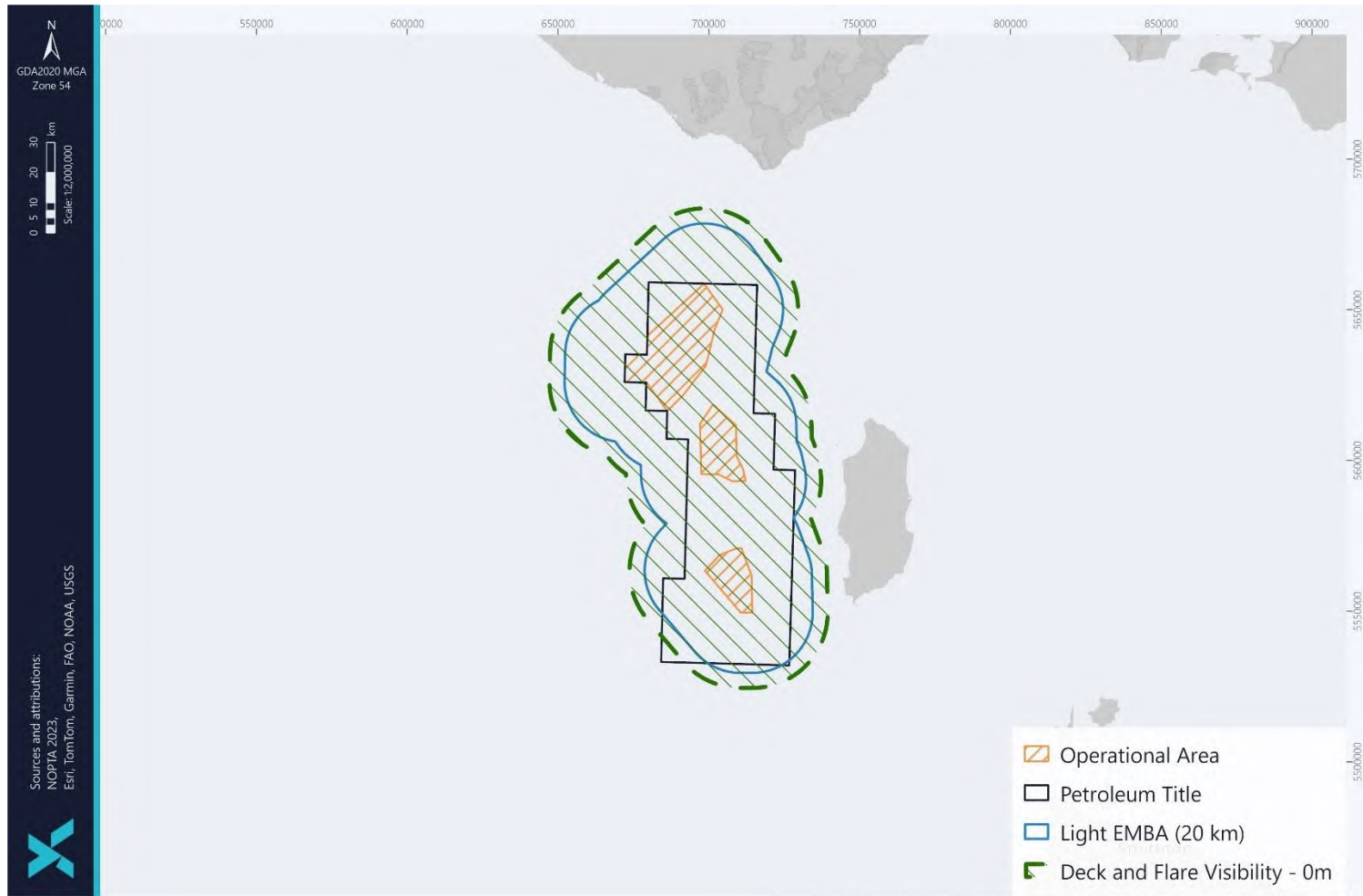


Figure 3-2 Area of Visibility (Deck and flare, 25 km)



4 LIGHT INTENSITY MODELLING

The two sources of artificial lighting (facility and flaring) for the Exploration Campaign were assessed separately, using published modelled and measured data as analogues.

It is noted that most commercial light modelling software requires the input of a number of factors, such as the light fitting type, quantity, and location of light sources – information which is not available at this preliminary stage. As such, the use of analogues was adopted, as this provided a real-world analogue on which to base the artificial light emissions assessment. It is also considered a conservative approach as does not include any best practice or additional mitigation measures that may be adopted by ConocoPhillips during the FEED of the project.

4.1 Facility Lighting

It is expected that the MODU for the Exploration Campaign will have a similar lit surface area as the drill rig utilised for the Woodside Torosa drilling campaign on Browse reef. The MODU utilised for the Exploration Campaign will be similar with similar lighting required for safe operations of the facilities. Therefore, the MODU facility light emissions would also be comparable to that of the Torosa facilities used during a previous light intensity modelling completed by ERM (2010). Light characteristics and modelling of light sources for the Torosa assessment are based on measured lighting data (lux levels and wavelength) obtained whilst drilling the Torosa South-1 appraisal well on the edge of the South Reef lagoon and ambient data when no activities were occurring at Scott Reef (SKM and ERM 2008). The drill rig used is a suitable analogue for the drill rig planned to be used for the T/49P Exploration Campaign.

The light intensity values derived from the measured Torosa South 1 well campaign were utilised for MODU facility lighting for the Exploration Campaign modelling.

4.2 Flare Light Emissions

The Exploration Campaign will require a MODU flare to dispose of the gas generated from well testing during the Exploration Campaign. The gas is produced and flared to allow for testing of the produced gas and oil as well as to calculate the size of the oil and gas reservoir. The excess oil and gas is sent to the flare disposal system to be burnt. The well test and flare system includes production systems, separator, knock out drums, ignition system and a flare. The flare for the MODU will be a horizontal boom flare extending out horizontally of the MODU deck. Flaring will occur for a duration of approximately 100 hours per well.

To inform the environmental impact assessment for Exploration Campaign environmental approvals, light intensity from a flare flow rate of 40 MMscfd was modelled. This represents a peak flaring rate from the well test systems.

Using the Gas Processors Suppliers Association Engineering Data Book (1998), it has been calculated that this expected rate of flaring will result in a flare flame length of approximately 13 m. This flame will generate light. Analogues are utilised to determine the likely amount of light emitted from the flame. This is discussed in section 0.



4.3 Method

4.3.1 Inverse Law

The light modelling used the inverse square law of illuminance which states that *a doubling of distance results in a reduction in illuminance by four times*, i.e., as a surface that is illuminated by a light source moves away from the light source, the surface appears dimmer. Light emitted becomes dimmer in an inverse square relationship to distance as represented in Figure 4-1 and in the mathematical equation below:

$$E = \frac{I}{D^2}$$

Where

- E = illuminance (in lux)
- I = luminous intensity (in candela)
- D = the distance from the light source in meters.

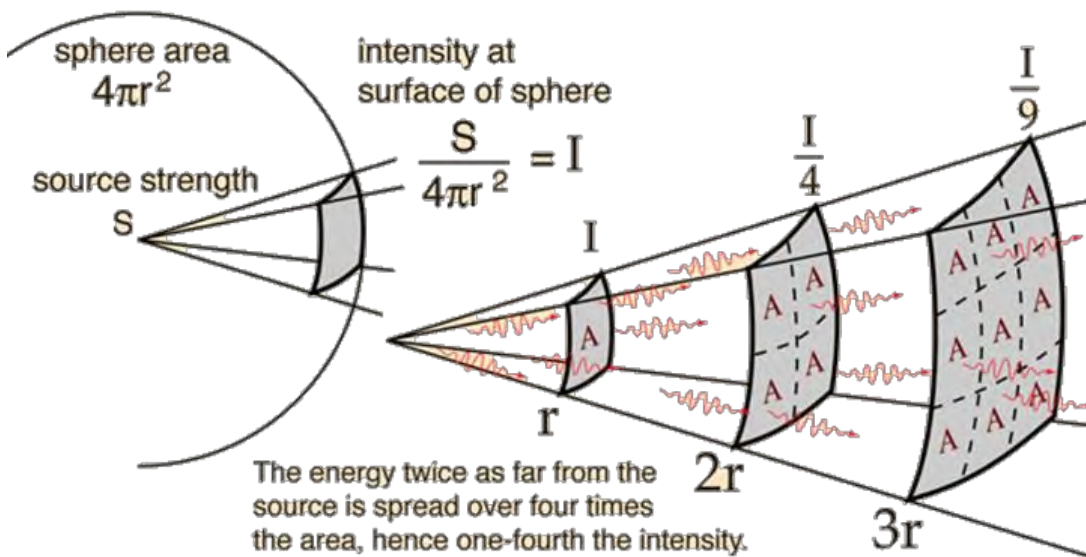


Figure 4-1 Inverse square law

Therefore, it is possible to calculate luminance intensity if the illuminance and the distance from the source is known (and vice versa).



4.3.2 Analogues

As flares are not designed to be luminaries (light emitting devices) there is some uncertainty in calculating luminance intensity from a flare. To reduce the uncertainty light measurements from an analogue existing flare have been utilised to calculate likely light emissions from the flare. These analogues are documented within publicly available literature on light emissions from flares.

The following analogues for gas flares were identified and are detailed in Table 4-1:

- Galoc Oil FPSO – Philippines
- Obigbo Oil Production facility – Nigeria
- Narrabri Gas Project safety flare – New South Wales
- Wheatstone LNG facility flare – Western Australia.

Table 4-1 Details of potential analogue natural gas flares

ANALOGUE SITE	FACILITY TYPE	FLARE RATE	LUMINANCE INTENSITY	ILLUMINANCE METHOD	REFERENCE
Galoc FPSO – Philippines	Tamarind operated FPSO oil facility continuous gas flare	~15 MMscfd 18–20 m high flame	Not specified	N/A (Flame height provided only)	Tamarind 2019
Wheatstone LNG Plant – Onslow, WA	Chevron-operated onshore LNG facility: Safety flare	Not specified	Not specified	Modelled Illuminance (lux)	URS 2010
Narrabri Gas Project – Bibblewindi, NSW	Proposed Santos-operated onshore gas production facility: Safety flare	244 MMscfd 30 m high flame	Not specified	Modelled Illuminance (lux) based on measured and calculated source data	Imbricata 2018
Obigbo North – Nigeria	Shell-operated oil production facility: Continuous flaring of associated gas	30 MMscfd	~1,805,000 candelas	Measured Illuminance (lux)	Isichei et al 1976 Nwaob 2005 European Commission 2014

The four analogues were compared to the expected flare characteristics (rates, flame heights) for the Exploration Campaign to determine if they were appropriate for use in this light emissions assessment.

The Galoc FPSO has a continuous flare which operates at a flare rate of ~15mmscfd, relatively close to the flare rate expected in the Exploration Campaign. However, the Galoc FPSO has not had light intensity levels or illuminance levels measured or modelled and is therefore not considered further within this light intensity assessment.

The Wheatstone LNG flare has modelled illuminance information, but no details on flare rate are publicly available. As an unknown, the Wheatstone LNG flare was carried through to the next stage of assessment as a potential analogue.



Despite the similar flame height (30 m for Narrabri compared to the 14.5 m from the Exploration Campaign MODU), the Narrabri gas flare rate is >200 MMscfd, which is an order of magnitude higher than that for the Exploration Campaign and as such was not considered an appropriate analogue and is not discussed further in this assessment.

The Obigbo facility has a continuous flare that is of similar scale and has a flare rate in the same order of magnitude to the rate expected for the Exploration Campaign. For these reasons the Obigbo oil production facility was considered an appropriate analogue for the MODU flare. A detailed study describing lux levels at varying distances from the operational flare was also available for the Obigbo oil production facility (Isichei et al. 1976). The detail provided in that study, as well as Nwaob (2005) and European Commission (2014) allows for the characteristics of the Obigbo flare to be scaled and allow for characterisation of other flares. This data provides the basis for the following flare light intensity modelling.

4.3.3 Model

The light model was built in Microsoft Excel utilising the inverse law of illumination (Section 4.3.1). The following assumptions were made:

- Obigbo North flare characteristics as stated in Table 4-1
- Combustion characteristics of the Exploration Campaign flare are similar to Obigbo
- No allowance was made for atmospheric or topographic interactions including shadowing, absorption or scattering as such the model is conservative and likely to overestimate illuminance at distance
- Flare luminance intensity is calculated directly proportional to flare flow rate
- Facility luminance intensity is combined with the flare luminance intensity as a total luminance intensity input into the model.

Illuminance was calculated every 100 m from the flare source (in lux), and results overlaid in GIS to identify geospatial contours.

A verification exercise of the Xodus Group light decay model (Xodus model) was conducted using the light decay model developed by Jacobs–SKM for the Browse FLNG Draft Environmental Impact Statement (Jacobs–SKM 2014). The verification exercise for the Xodus model plotted the Xodus Group light model expected illuminance for the Browse Development against the Jacobs–SKM modelled illuminance for the Browse Development. The Xodus model predicted illumination levels aligned with the Jacobs - SKM model verifying the Xodus model outcomes.



4.4 Results and Recommendations

The results of the light intensity modelling are summarised in Table 4-2 and are also shown graphically for the Exploration Campaign in Figure 4-2 to Figure 4-5.

Table 4-2 Illuminance modelling results and Obigbo analogue

SITE/SCENARIO	FLARE LUMINANCE INTENSITY (CD)	LIGHT ILLUMINANCE (LUX)						
		Distance from Facility (km)						
		0.5 km	1 km	5 km	10 km	20 km	30 km	60 km
Analogue Case								
Obigbo Facility – Nigeria	~1,805,000	7.2	1.8	0.072	0.018	0.004	0.002	< 0.002
Modelled Cases								
Exploration Campaign facility lighting from the MODU	~100,000	0.4	0.1	0.004	0.001	0.0002	<0.0001	<0.0001
Exploration Campaign combined facility lighting and flaring from the MODU (40 MMscfd)	~ 2,495,66	10.0	2.5	0.100	0.025	0.006	0.003	0.0007

For the Exploration Campaign, the model predicted the following for the combined facility lighting and flaring rate of 40 MMscfd during flaring (Figure 4-2 and Figure 4-3):

- Light intensity levels greater than 0.1 lux are predicted to occur up to 5 km from the MODU, comparable to ambient light levels during full moon to twilight
- Between 5 km and 16 km from the MODU, the model predicted light intensity levels comparable to ambient light levels during a quarter moon to full moon night sky (0.01 lux to 0.1 lux)
- Between 16 km and 49 km, light intensity levels were predicted to be between 0.01 lux and 0.001 lux, which is comparable to ambient light intensity levels between a moonless clear night sky and a quarter moon
- Beyond 49 km there was no measurable change to the ambient light intensity levels.

For the Exploration Campaign, the model predicted the following for the facility lighting when not flaring (Figure 4-4 and Figure 4-5):

- Light intensity levels greater than 0.1 lux are predicted to occur up to 1 km from the MODU, comparable to ambient light levels during full moon to twilight
- Between 1 km and 3 km from the MODU, the model predicted light intensity levels comparable to ambient light levels during a quarter moon to full moon night sky (0.01 lux to 0.1 lux)
- Between 3 km and 9 km, light intensity levels were predicted to be between 0.01 lux and 0.001 lux, which is comparable to ambient light intensity levels between a moonless clear night sky and a quarter moon
- Beyond 9 km there was no measurable change to the ambient light intensity levels.



As noted in Section 2.3, in recognition that photometric measurements are biased towards the human eye response to light, the spatial extent potentially impacted by visible light from the MODU, as a visible dot on the horizon, is out to a distance of 9 km from the position of the MODU when not flaring (Figure 4-4 and figure 4-5). Note: This is distinct from the biological light EMBA which is relevant for the potential assessment of impacts to, for example, birds.

Therefore, during the operational phase of the ConocoPhillips Australia, the Potential Impact Area for flare lighting is 49 km from the expected position of the MODU during flaring (Figure 4-2 and Figure 4-3), which will reduce to 9 km from the expected position of the MODU when not flaring (Figure 4-4 and Figure 4-5).

It is recommended that environmental impact assessment consider the potential impact of light emissions. Based on the outcome of the environmental impact assessment it is recommended that the project conducts a review of facility lighting design and management against the *Light Pollution Guidelines: National Light Pollution Guidelines for Wildlife* (CoA, 2023) Principles of Best Practice Lighting Design and incorporate ALARP lighting controls.

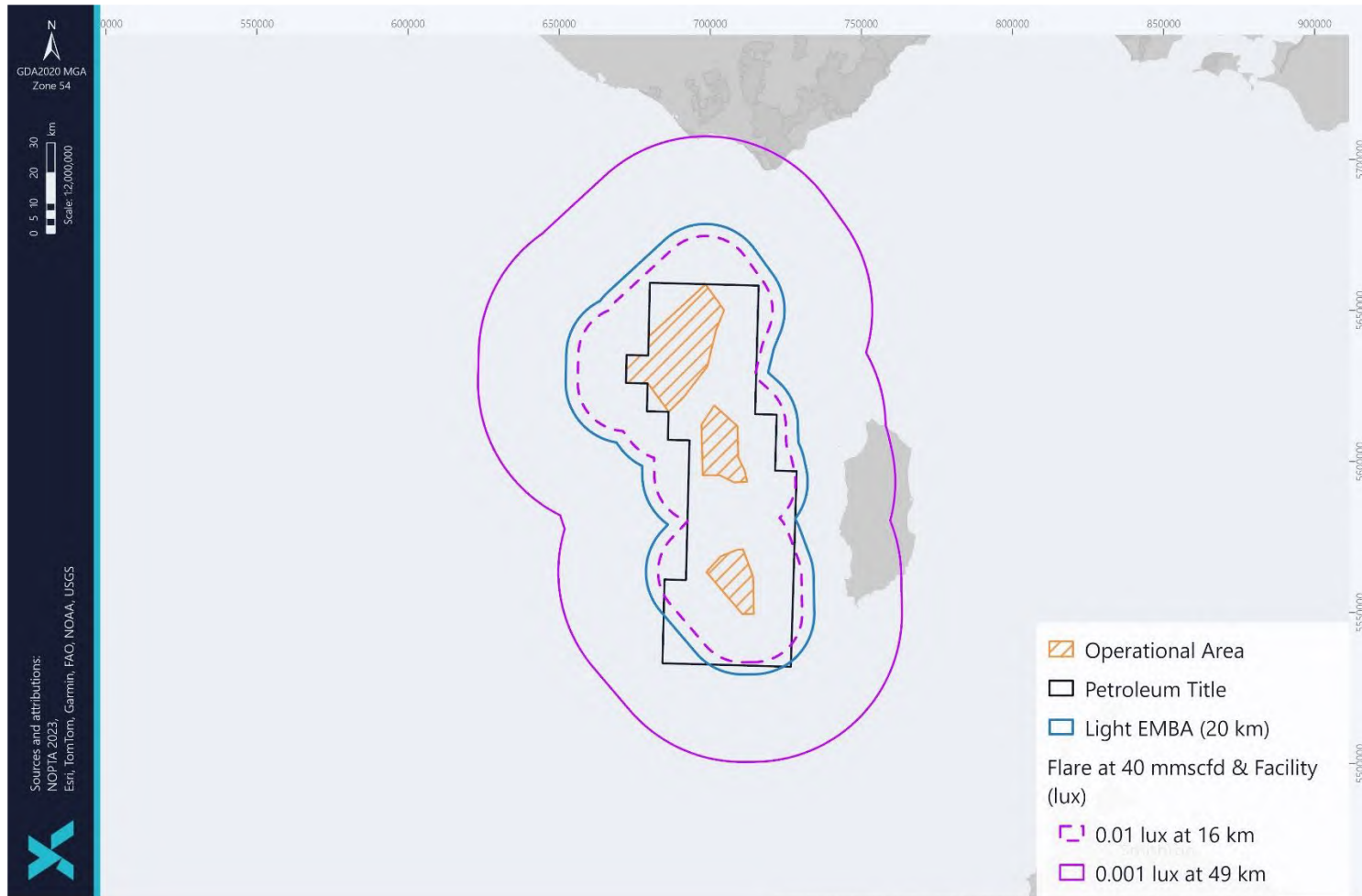


Figure 4-2 Expected light intensity levels from flare and facility lighting on the MODU during flaring (40 MMscfd).

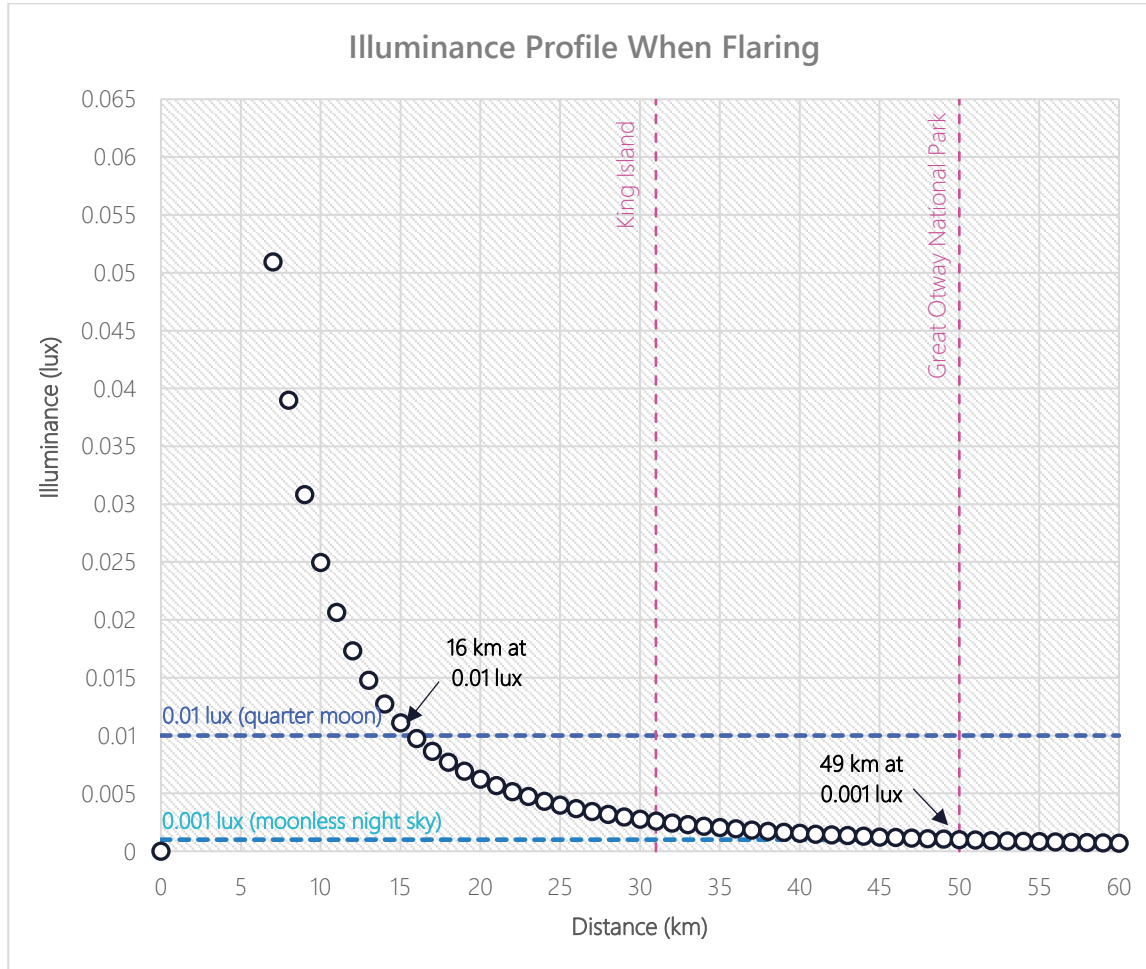


Figure 4-3 Expected light intensity levels from flare and facility lighting on the MODU during flaring (40 MMscfd)

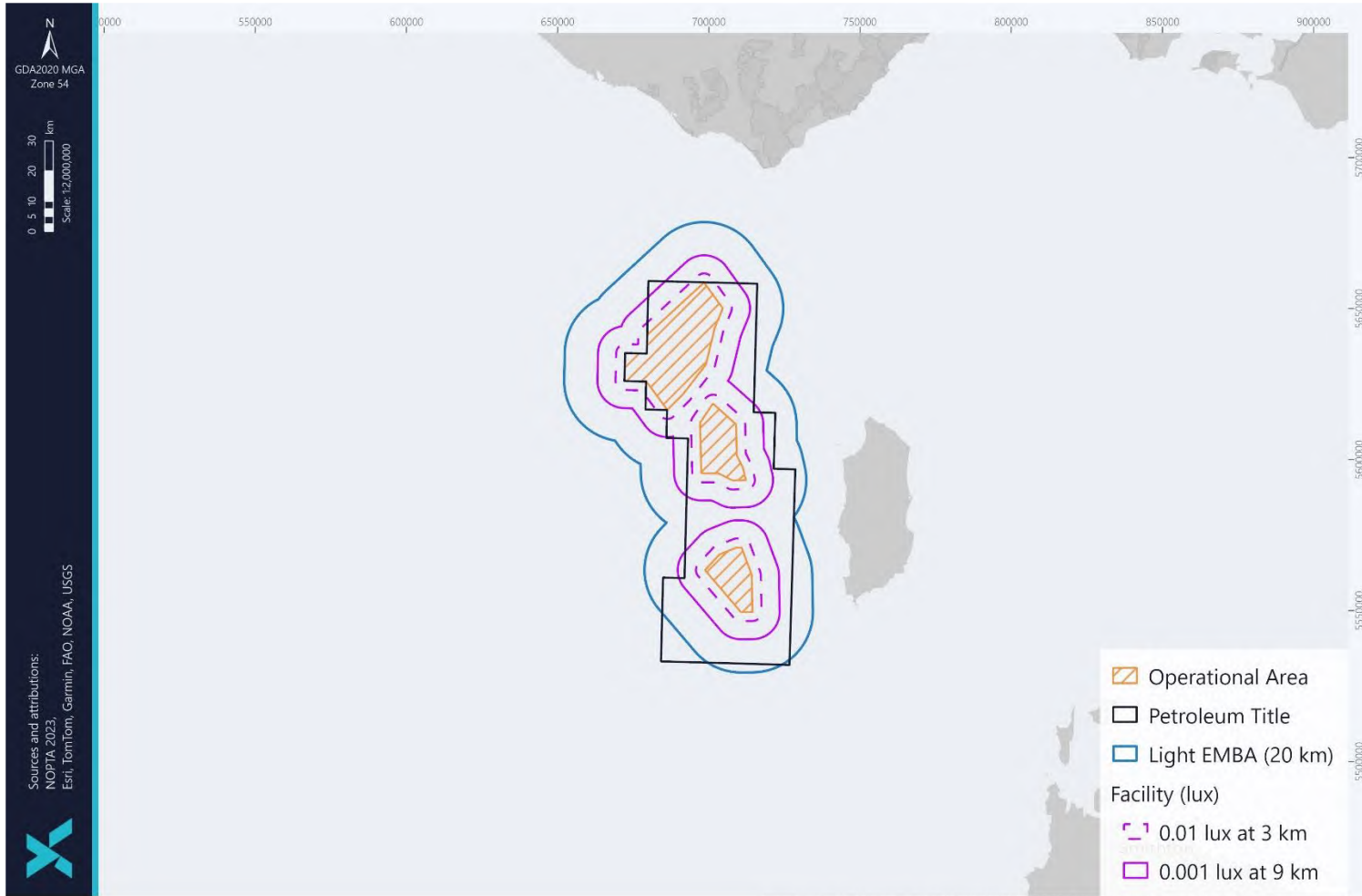


Figure 4-4 Expected light intensity levels from facility lighting on the MODU when not flaring

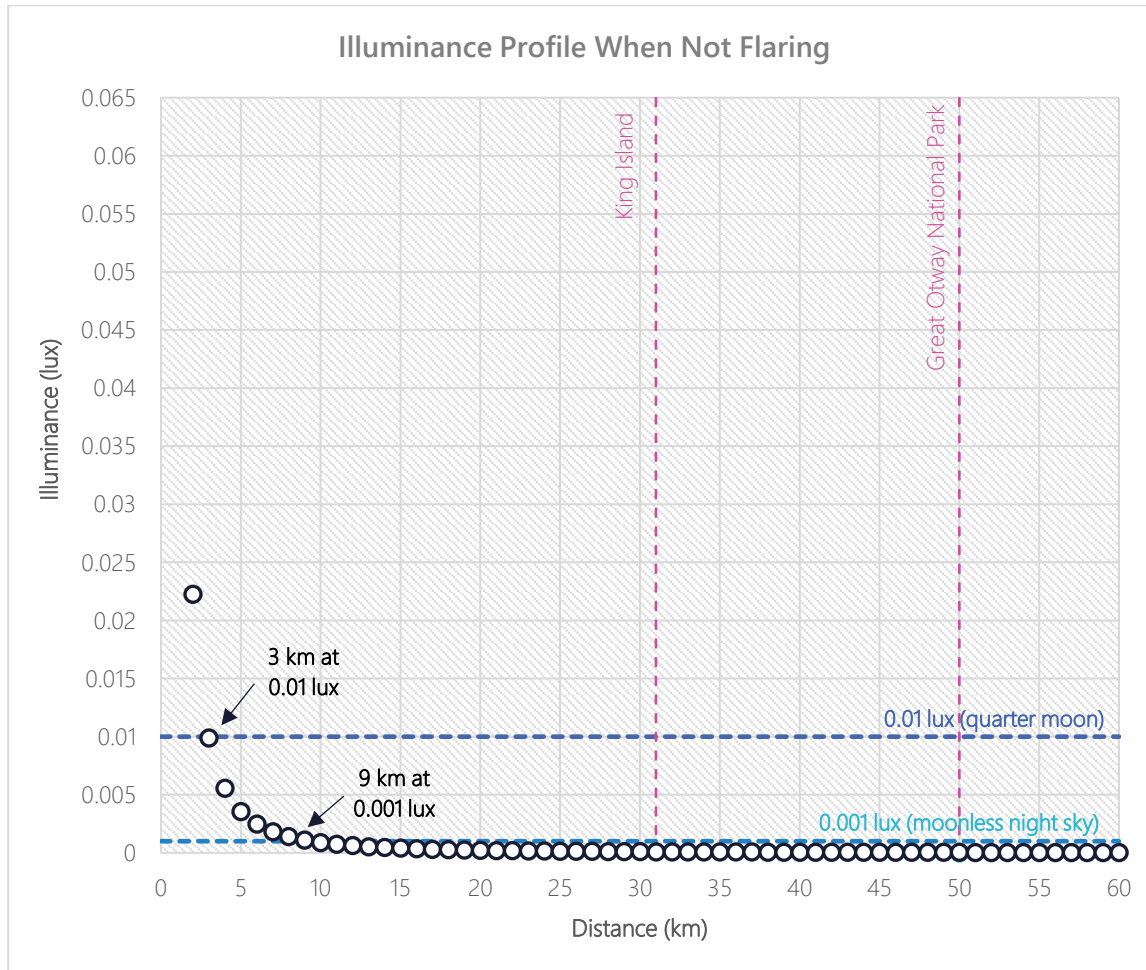


Figure 4-5 Expected light intensity levels from facility lighting on the MODU when not flaring



5 ABBREVIATIONS

ACRONYM	DESCRIPTION
cd	candela (unit of measurement for luminous intensity)
CIE	Commission International de l'Eclairage
FEED	Front end engineering design
FID	Final investment decision
FPSO	Floating production storage and offtake facility
FSO	Floating storage and offloading
K	kelvin (unit of measurement for temperature)
km	kilometre (unit of measurement for distance)
LNG	Liquefied natural gas
lm	lumen (unit of measurement for luminous flux)
m	metre (unit of measurement for distance)
m ²	metres squared (unit of measurement for area)
MMscfd	Million standard cubic feet per day (unit of measurement for gas)
MODU	Mobile offshore drilling unit
nm	nanometre (unit of measurement for distance)
sr	steradian (or square radian; unit of a solid angle)
W	watt (unit of measurement for radiant power)



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APPENDIX G NOISE MODELLING REPORTS

Otway Exploration Drilling Program

Acoustic Modelling for Assessing Marine Fauna Sound Exposures

JASCO Applied Sciences (Australia) Pty Ltd

15 June 2024

Submitted to:

Xodus Group

Contract 0000000012

Authors:

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The results presented herein are relevant within the specific context described in this report. They could be misinterpreted if not considered in the light of all the information contained in this report. Accordingly, if information from this report is used in documents released to the public or to regulatory bodies, such documents must clearly cite the original report, which shall be made readily available to the recipients in integral and unedited form.

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Executive Summary

JASCO Applied Sciences (JASCO) performed a modelling study of underwater sound levels associated with the ConocoPhillips Otway Exploration Drilling Program to inform the Environmental Impact Identification (ENVID) process. This study considered specific components of the program across two petroleum titles (T/49P and VIC/P79), at representative nominal well locations within two operational areas.

This modelling study considers a range of activities including:

- Continuous noise emissions from:
 - An anchored Mobile Offshore Drilling Unit (MODU) conducting drilling operations.
 - Associated Anchor Handler Tug Supply (AHTS) vessel resupplying the MODU under dynamic positioning (DP).
 - An AHTS on standby near the MODU (patrolling a prescribed area at slow speed).
 - AHTS involved in pre-lay and mooring activities for the MODU.
- Impulsive noise emissions from a boomer-type Sub Bottom Profiler (SBP) during seabed surveys and Vertical Seismic Profiling (VSP) during well evaluation operations. As the boomer source had not been decided at the time of the modelling study, a commonly used representative system was used for the modelling, with levels derived from a previous JASCO field measurement campaign. For the VSP seismic source, JASCO's specialised airgun array source model was used to predict the acoustic signature.

The study assessed distances from operations where underwater sound levels reached thresholds corresponding to various levels of potential impact to marine fauna. The animals considered here included marine mammals, turtles, fish (including fish eggs and larvae) and benthic invertebrates. Due to the variety of species considered, there are several thresholds for evaluating effects, including: mortality, injury, temporary reduction in hearing sensitivity, and behavioural disturbance. Of particular note, whilst the newly published Southall et al. (2021) provides recommendations and discusses the nuances of assessing behavioural response, the authors do not recommend new numerical thresholds for onset of behavioural responses for marine mammals.

The modelling methodology considered scenario-specific source levels and range-dependent environmental properties. Estimated underwater acoustic levels for non-impulsive (continuous) noise sources presented as sound pressure levels (SPL, L_p), and as accumulated sound exposure levels (SEL, L_E). Estimated underwater acoustic levels for impulsive noise sources (VSP) are presented as sound pressure levels, zero-to-peak pressure levels (PK, L_{pk}), peak-to-peak pressure levels (PK-PK; L_{pk-pk}), and either single-impulse (i.e., per-pulse) or accumulated sound exposure levels as appropriate for different noise effect criteria. In this report, the duration of the SEL accumulation is defined as integrated over a 24 h period.

The SEL_{24h} is a cumulative metric that reflects the dosimetric impact of noise levels within 24 h based on the assumption that an animal is consistently exposed to such noise levels at a fixed position. The corresponding SEL_{24h} radii represent an unlikely worst-case scenario. More realistically, marine mammals (as well as fish and turtles) would not stay in the same location for 24 h. Therefore, a reported radius for SEL_{24h} criteria does not mean that marine fauna travelling within this radius of a source will be injured, but rather that an animal could be exposed to the sound level associated with impairment if it remained in that location for 24 h.

Vessel and Drilling Noise

For the results below, the distances to isopleths/thresholds were reported from the most dominant single source. Maps are provided in the report to assist with contextualising tabulated distances. The key results of this acoustic modelling study are summarised below. There are no thresholds for invertebrates for effects from non-impulsive noise, therefore no results are reported.

A key finding from the study is that despite the 17 m (18%) depth difference between Essington and Garfield, Garfield's placement approximately 10 km closer to the shelf edge and similar geology between the two sites, the variations observed in the ranges to thresholds for the vessel related activities at both sites are minimal. While the proximity to the shelf edge does not greatly affect the results of inshore sites, Garfield West, located effectively on the shelf edge, clearly demonstrates the extended ranges to threshold expected in the offshore direction. Additionally, Garfield West has a highly reflective seabed geology, contributing to the favourable propagation conditions observed. The reason this extended propagation is not observed in the near shelf sites is due to the combination of sources and the source depths used in the modelling, the almost linear sound speed profile in the top 200 m and the attenuating influence of the calcarenite seafloor.

Marine mammals:

The maximum distances to the (NOAA) (2019) marine mammal behavioural response criterion of 120 dB re 1 μ Pa (SPL) are presented in Table 1. The results for the criteria from Southall et al. (2019) for marine mammal PTS and TTS for MODU and vessel operations were assessed for all scenarios assessed for each nominal location. The maximum distances and total ensonified areas are presented in Table 2.

Table 1. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to the marine mammal behavioural response criterion of 120 dB re 1 μ Pa (SPL) from the most appropriate location for considered sources per scenario.

Scenario	Description	British Admiral		Flanagan		British Admiral West		Merope (66 m depth)		Julpha (45 m depth)		Essington (93 m depth)		Garfield (110 m depth)		Garfield West (168 m depth)	
		R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)
1	Prelay: 1 × anchor handler working on site within 2 km of location	0.50	0.47	0.44	0.42	n/a	n/a	0.44	0.39	0.42	0.40	0.47	0.44	0.44	0.41	n/a	n/a
2	Mooring: Moored semi-sub idle (no noise); 1 × anchor handler on bridle on DP; 2 × anchor handlers working on site within 2 km of location	11.3	10.3	11.8	10.6	n/a	n/a	12.0	10.6	12.2	10.9	11.6	10.5	11.6	10.1	n/a	n/a
3	Drilling: Anchored MODU drilling	1.41	1.30	1.34	1.24	1.48	1.25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.39	1.16
4	Drilling and resupply: Anchored MODU drilling; 1 × anchor handler at rig doing resupply (8 h)	11.4	10.4	12.0	10.9	11.8	10.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.8	18.9
5	Drilling with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km	2.32	2.09	2.03	10.7	n/a	n/a	2.25	2.03	2.39	2.12	2.44	2.11	2.32	2.00	n/a	n/a
6	Drilling, resupply, with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km; 1 × anchor handler at rig doing resupply (8 h)	11.4	10.4	12.0	10.9	n/a	n/a	12.6	10.8	12.3	11.1	12.2	10.9	12.2	10.2	n/a	n/a

DP: Dynamic Positioning, MODU: Mobile Offshore Drilling Unit; n/a indicates scenario was not assessed.

Table 2. Summary: Maximum (R_{max}) horizontal distances (in km) and ensonified area (km^2) for the frequency-weighted LF-cetacean SEL_{24h} temporary threshold shift (TTS) from the most appropriate location for the considered scenario.

Scenario	Description	British Admiral		Flanagan		British Admiral West		Merope (66 m depth)		Julpha (45 m depth)		Essington (93 m depth)		Garfield (110 m depth)		Garfield West (168 m depth)	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
1	Prelay: 1 × anchor handler working on site within 2 km of location	0.07	0.69	0.07	0.69	n/a	n/a	2.53	0.69	2.70	0.69	2.73	0.69	2.49	0.69	n/a	n/a
2	Mooring: Moored semi-sub idle (no noise); 1 × anchor handler on bridle on DP; 2 × anchor handlers working on site within 2 km of location	2.88	21.1	3.11	22.2	n/a	n/a	3.42	28.8	3.59	29.8	3.11	22.2	2.82	18.9	n/a	n/a
3	Drilling: Anchored MODU drilling	0.40	0.41	0.38	0.45	0.42	0.40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.23	0.16
4	Drilling and resupply: Anchored MODU drilling; 1 × anchor handler at rig doing resupply (8 h)	1.76	7.25	1.68	7.38	1.66	7.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.30	11.5
5	Drilling with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km	0.41	1.08	0.40	1.12	n/a	n/a	0.41	1.09	0.46	1.23	0.41	1.13	0.39	1.03	n/a	n/a
6	Drilling, resupply, with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km; 1 × anchor handler at rig doing resupply (8 h)	1.79	7.93	1.68	8.02	n/a	n/a	1.93	7.98	1.64	11.1	1.62	7.81	1.62	6.98	n/a	n/a

DP: Dynamic Positioning, MODU: Mobile Offshore Drilling Unit; n/a indicates scenario was not assessed.

Sea turtles:

The maximum distance to the SEL_{24h} metrics of 220 dB re 1 $\mu\text{Pa}^2\text{s}$ for PTS and 200 dB re 1 $\mu\text{Pa}^2\text{s}$ for TTS was 0.06 km for PTS onset and 0.14 km for TTS onset for the non-impulsive noise sources (Finneran et al. 2017). As is the case with marine mammals, a reported radius for SEL_{24h} criteria does not mean that sea turtles travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with either PTS or TTS if it remained in that location for 24 hours.

Fish:

Sound produced by the MODU and/or vessel operations are predicted to reach the sound levels associated with physiological effects, recoverable injury, and TTS for some fish species in close proximity to the sound sources (within 20 m). For the thresholds to be exceeded, fish would have to remain at those distances for either 12 or 48 h.

Vertical Seismic Profiling**Marine mammals:**

The results for marine mammal injury applied the criteria from Southall et al. (2019), which requires two metrics (PK and SEL_{24h}) to be considered in when assessing marine mammal Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS), with the longest distance associated with either metric being required to be applied. Table 3 summarises the maximum distances for PTS, along with the relevant metric associated with the maximum PTS distance. The maximum distance where the NOAA (2019) marine mammal behavioural response criterion of 160 dB re 1 μPa (SPL) is also presented in Table 3. The maximum distance where the NOAA (2019) marine mammal behavioural response criterion of 160 dB re 1 μPa (SPL) is also presented in Table 3. The maximum range to the low-frequency cetacean weighted threshold of 140 dB re 1 μPa (SPL) from Wood et al. (2012), applied to migrating southern right whales, was 6.48 km.

Table 3. Summary of maximum (R_{max}) horizontal distances (in km) from any modelled site to behavioural response thresholds and temporary threshold shift (TTS) and permanent threshold shift (PTS) for marine mammals. Maximum extents are in the broadside direction.

Hearing group	Modelled distance to effect threshold (R_{max})		
	Behavioural response ^a	Impairment: TTS ^b	Impairment: PTS ^b
Low-frequency (LF) cetaceans	1.50	2.39 ^c	0.33 ^c
High-frequency (HF) cetaceans		–	–
Very high-frequency (VHF) cetaceans		0.25 ^d	0.11 ^d
Otariid Pinnipeds		–	–

Noise exposure criteria: ^a NOAA (2019) and ^b Southall et al. (2019)

^c Longest distance to threshold from all SEL_{24h} results

^d Longest distance to threshold from all PK results

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Sea turtles

- The PK sea turtle injury criteria of 232 dB re 1 μPa for PTS and 226 dB re 1 μPa for TTS from Finneran et al. (2017) was not exceeded at a distance longer than 20 m from the acoustic centre of the source.
- The maximum distance to the SEL_{24h} metrics of 204 dB re 1 $\mu\text{Pa}^2\text{s}$ for PTS and 189 dB re 1 $\mu\text{Pa}^2\text{s}$ for TTS was 0.03 km for PTS onset and 0.27 km for TTS onset for the 750 in³ seismic source

(Finneran et al. 2017). As is the case with marine mammals, a reported radius for SEL_{24h} criteria does not mean that sea turtles travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with either PTS or TTS if it remained in that location for 24 hours.

- Table 4 summarises the distances to where the criterion for behavioural response of turtles to 166 dB re 1 µPa (SPL) and the 175 dB re 1 µPa (SPL) threshold for behavioural disturbance (McCauley et al. 2000a), and the distances to where temporary threshold shift (TTS) and permanent threshold shift (PTS) (Finneran et al. 2017) could be exceeded.

Table 4. Summary of horizontal distances (in km) to turtle behavioural response criteria, temporary threshold shift (TTS), and permanent threshold shift (PTS).

Hearing group – Sea Turtles				
Location	Behavioural response ¹	Behavioural disturbance ¹	Impairment: TTS ²	Impairment: PTS ²
T/49P - British Admiral	0.92 (SPL)	0.36 (SPL)	0.27 (SEL _{24h})	0.03 (SEL _{24h})
T/49P - Flanagan	0.92 (SPL)	0.37 (SPL)	0.27 (SEL _{24h})	0.03 (SEL _{24h})
VIC/P79 (northern extent) Julpha	0.83 (SPL)	0.37 (SPL)	0.23 (SEL _{24h})	0.03 (SEL _{24h})
VIC/P79 (southern extent) Garfield	0.89 (SPL)	0.35 (SPL)	0.26 (SEL _{24h})	0.03 (SEL _{24h})

Noise exposure criteria: McCauley et al. (2000a), and ² Finneran et al. (2017)

Fish, fish eggs, and fish larvae:

This modelling study assessed the ranges for quantitative criteria based on Popper et al. (2014) and considered both PK and SEL_{24h} metrics associated with mortality and potential mortal injury as well as impairment in the following groups:

- Fish without a swim bladder (also appropriate for sharks in the absence of other information),
- Fish with a swim bladder that do not use it for hearing,
- Fish that use their swim bladders for hearing, and
- Fish eggs and fish larvae.

Table 5 summarises the maximum distances to effect criteria for fish, fish eggs, and fish larvae along with the relevant metric for both modelled locations.

Table 5. Summary of maximum fish, fish eggs, and larvae injury and temporary threshold shift (TTS) onset distances for any modelled site, for single impulse and 24 h sound exposure level (SEL_{24h}) modelled scenarios.

Relevant hearing group	Effect criteria	Water column	
		Metric associated with longest distance to criteria	R _{max} (km)
Fish: No swim bladder	Recoverable injury	N/A	–
	TTS	SEL _{24h}	0.45
Fish: Swim bladder not involved in hearing and Swim bladder involved in hearing	Recoverable injury	SEL _{24h}	0.05
	TTS	SEL _{24h}	0.45
Fish eggs, and larvae	Injury	PK	0.05

Benthic invertebrates:

To assist with assessing the potential effects on crustaceans, the following results were determined:

- The sound level of 202 dB re 1 μ Pa PK-PK from Payne et al. (2008), which is representative of no effects, was considered for seafloor sound levels; the sound level was reached at a maximum distance of 169.6 m from the acoustic centre of the VSP array, at Garfield in the southern extent of VIC/P79).
- The sound levels of 209–212dB re 1 μ Pa PK-PK from Day et al. (2016b) was reached at 74.2–39.0 m and 213 dB re 1 μ Pa from Day et al. (2016a) was reached at 27.5 m from the acoustic centre of the VSP array, only at Julpha in the northern extent of VIC/P79, and was not reached at any distance from the source at any other site.

Boomer SBP

As the boomer is also considered an impulsive source, the same metrics and thresholds as applied to the VSP analysis are applied to the SBP.

Marine mammals:

Table 6 summarises the maximum distances for PTS, along with the relevant metric associated with the maximum PTS distance for the SPB results. The maximum distance where the NOAA (2019) marine mammal behavioural response criterion of 160 dB re 1 μ Pa (SPL) is also presented in Table 6. The maximum range to the low-frequency cetacean weighted threshold of 140 dB re 1 μ Pa (SPL) from Wood et al. (2012), applied to migrating southern right whales, was 0.13 km.

Table 6. Summary of maximum (R_{max}) horizontal distances (in km) from any modelled site to behavioural response thresholds and temporary threshold shift (TTS) and permanent threshold shift (PTS) for marine mammals. Maximum extents are in the broadside direction.

Hearing group	Modelled distance to effect threshold (R_{max})		
	Behavioural response ^a	Impairment: TTS ^b	Impairment: PTS ^b
Low-frequency (LF) cetaceans	–	–	–
High-frequency (HF) cetaceans		–	–
Very high-frequency (VHF) cetaceans		0.02	–
Otariid pinnipeds in water		–	–

Noise exposure criteria: ^a NOAA (2019) and ^b Southall et al. (2019)

^c Longest distance to threshold from SEL_{24h} results

^d Longest distance to threshold from PK results

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Sea turtles:

No thresholds for effect on sea turtles were reached by the boomer SBP.

Fish, fish eggs, and fish larvae:

No fish, fish eggs, or fish larvae thresholds were reached within the modelled resolution.

Benthic invertebrates:

The PK and PK-PK sound levels produced by the SBP did not exceed any of the thresholds for effects on benthic invertebrates within the modelled resolution.

1. Introduction

JASCO Applied Sciences (Australia) performed a modelling study of underwater acoustic noise emissions associated with the ConocoPhillips Otway Exploration Drilling Program. This study specifically assessed distances from the considered operations to where underwater sound levels reached thresholds corresponding to various levels of impact to marine fauna. The key fauna considered in this study included marine mammals, sea turtles, fish (including fish eggs and larvae), and benthic invertebrates. Due to the variety of species considered, there are several different thresholds for evaluating effects, including: mortality, injury, temporary reduction in hearing sensitivity, and behavioural disturbance.

The modelling methodology considered source directivity and range-dependent environmental properties. Estimated underwater acoustic levels are presented as sound pressure levels (SPL, L_p), zero-to-peak pressure levels (PK, L_{pk}), peak-to-peak pressure levels (PK-PK, L_{pk-pk}), and either single-impulse (i.e., per-pulse) or accumulated sound exposure levels (SEL, L_E) as appropriate for different noise effect criteria for either non-impulsive (vessels and drilling) or impulsive (VSP) noise sources.

1.1. Acoustic Modelling Scenario Details

This study considered the following activities associated with the drilling campaign within the *British Admiral* and *Flanagan* drill targets:

- Pre-lay operations by an Anchor Handler Tug Supply (AHTS) vessel working on site.
- Mooring operations where an anchored Mobile Offshore Drilling Unit (MODU) is idle, one AHTS is keeping position on the bridle using dynamic positioning (DP), and two AHTS are working on site within 2 km of the MODU.
- Drilling operations from a MODU, only assessed for T/49P and discontinued due to unlikelihood of scenario during operations.
- Drilling operation from a MODU with an AHTS conducting resupply operations, using DP, only assessed for T/49P and discontinued due unlikelihood of scenario during operations.
- Drilling operation from a MODU with a AHTS on standby, transiting at low speed within a prescribed area, 2 km from the MODU.
- Drilling operation from a MODU with an AHTS conducting resupply operations, using DP, and a AHTS transiting at low speed within the standby area, 2 km from the MODU.
- Vertical seismic profiling (VSP) during drilling operations at nominal wells within T/49P and VIC/P79.
- Boomer type Sub-Bottom Profiling (SBP) surrounding nominal wells in VIC/P79.

Details of the modelled sites are displayed graphically for nominal wells in:

- T/49P – shown in Figure 1 and listed in Table 7, with focused maps for the *British Admiral* and *Flanagan* nominal drill locations presented in Figures 2 and 3.
- VIC/P79 northern extent – shown in Figure 4 and listed in Table 8, with focused maps for the *Merope* and *Julpha* nominal drill locations presented in Figure 5 and Figure 6, and sub-bottom profiling shown around *Julpha* in Figure 7.
- VIC/P79 southern extent – shown in Figure 8 and listed in Table 9, with focused maps for the *Essington* and *Garfield* nominal drill locations presented in Figure 9 and Figure 10, the deeper *Garfield West* shown in Figure 11, and sub-bottom profiling shown around *Garfield* in Figure 12.

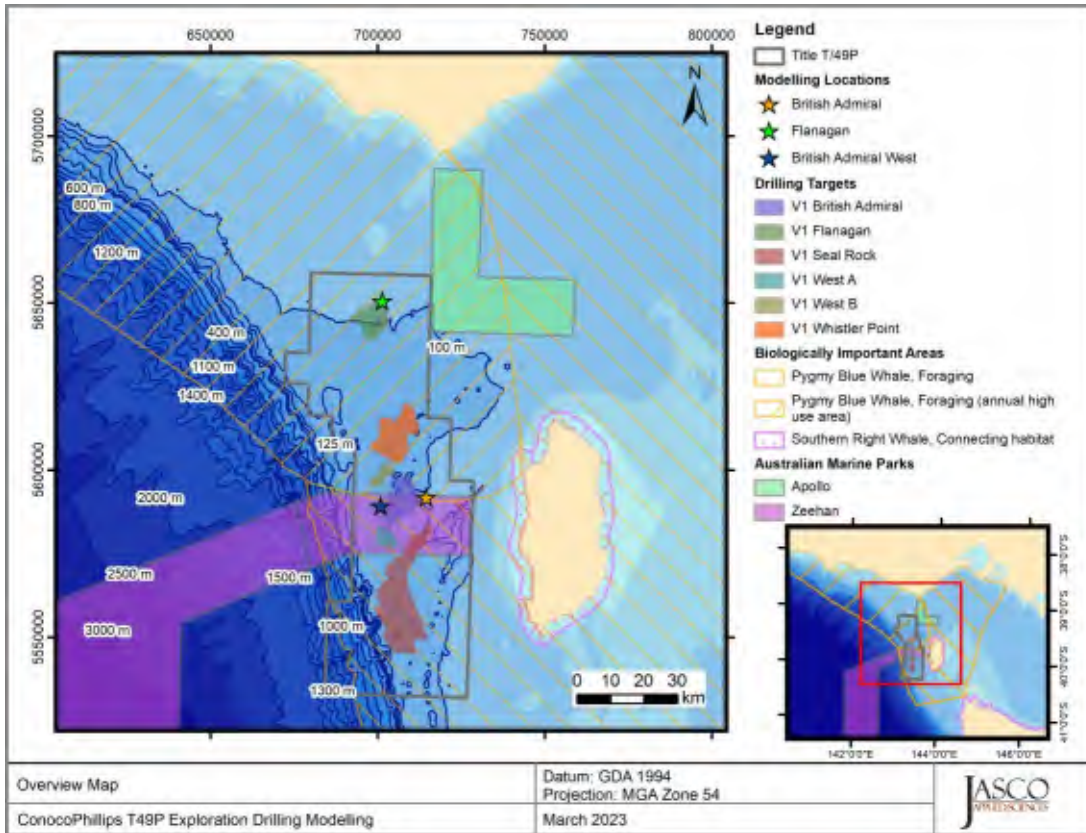


Figure 1. T/49P overview map of modelled extent and modelled sites. Table 9 lists receiver locations from north to south.

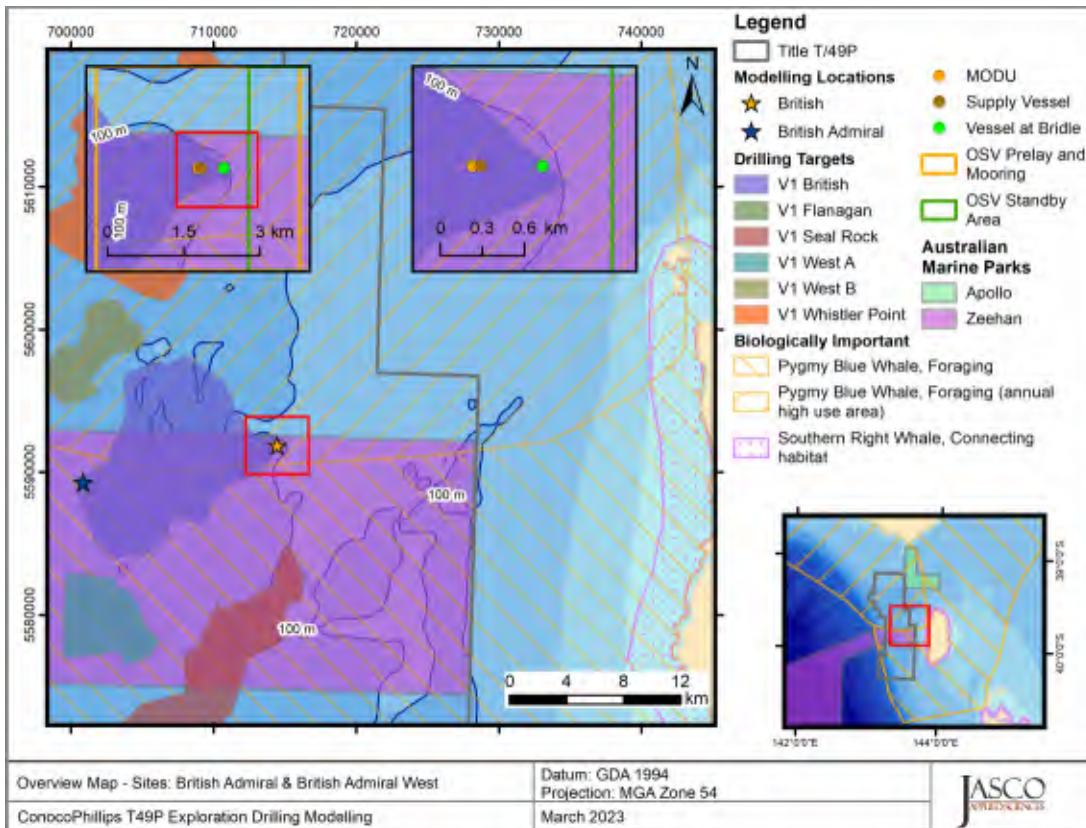


Figure 2. T/49P British Admiral nominal drill target focused map showing modelled features. Table 9 lists receiver locations from north to south.

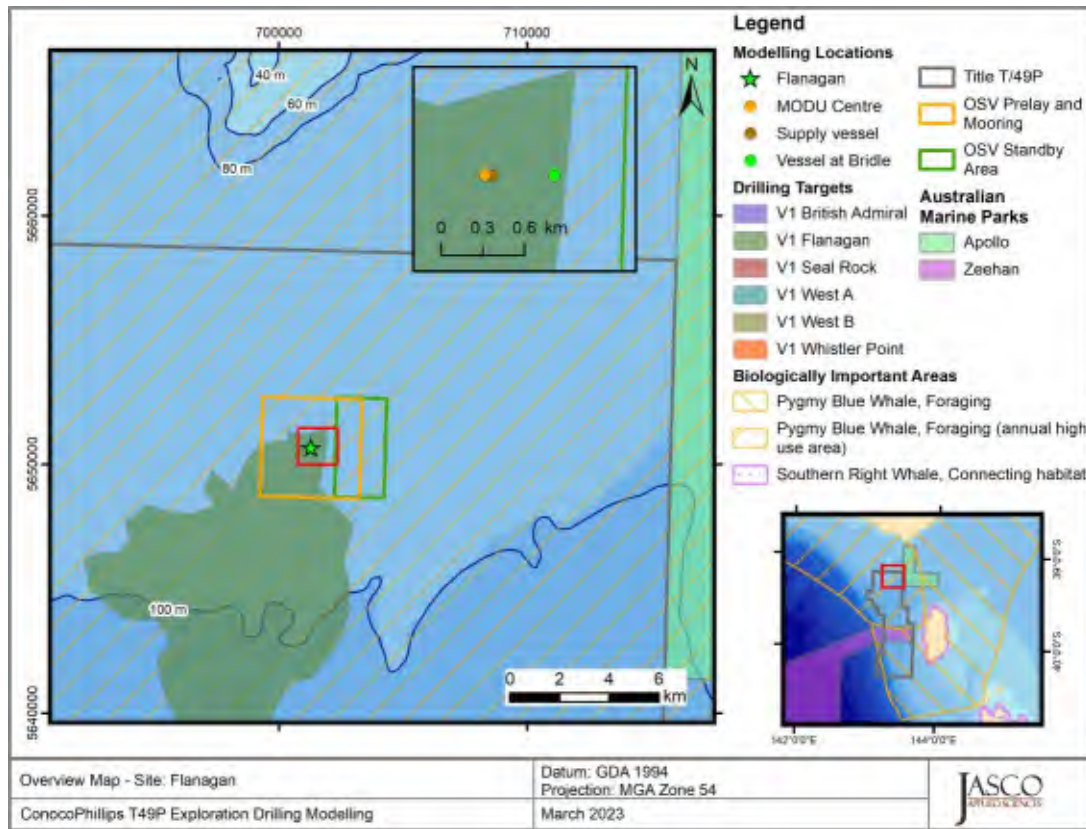


Figure 3. T/49P Flanagan nominal drill target focused map showing modelled features.

Table 7. T/49P modelled site locations and source information.

Location	Site	Source	Latitude	Longitude	MGA Zone 54 (GDA94)		Water depth (m)
					X (m)	Y (m)	
British Admiral	MODU	Ocean Onyx (MODU) and VSP array	39° 47' 46.0465" S	143° 30' 16.9905" E	714449	5591869	102
	Supply vessel	Generic AHTS at DP	39° 47' 46.0482" S	143° 30' 19.4048" E	714507	5591868	
	Vessel at Bridle	Generic AHTS at DP	39° 47' 45.6045" S	143° 30' 37.9921" E	714949	5591869	
	2 km east of MODU	Generic AHTS at slow transit	9° 47' 44.2356" S	143° 31' 41.0052" E	716449	5591869	
	2 km west of MODU	Generic AHTS at slow transit	39° 47' 47.8648" S	143° 28' 52.9676" E	712449	5591869	
Flanagan	MODU	Ocean Onyx (MODU) and VSP array	39° 16' 11.7290" S	143° 20' 00.1274" E	701292	5650674	92
	Supply vessel	Generic AHTS at DP	39° 16' 11.7308" S	143° 20' 02.5420" E	701350	5650672	
	Vessel at Bridle	Generic AHTS at DP	39° 16' 11.2837" S	143° 20' 20.9453" E	701792	5650674	
	2 km east of MODU	Generic AHTS at slow transit	39° 16' 10.0706" S	143° 21' 23.4942" E	703292	5650674	
	2 km west of MODU	Generic AHTS at slow transit	39° 16' 13.3927" S	143° 18' 36.7290" E	699292	5650674	
British Admiral West	MODU	Ocean Onyx (MODU) and VSP array	39° 49' 21.9528" S	143° 49' 21.9528" E	700837	5589279	103
	Supply vessel	Generic AHTS at DP	39° 49' 21.8433" S	143° 20' 50.3982" E	700895	5589281	

DP: Dynamic Positioning, MODU: Mobile Offshore Drilling Unit, VSP: vertical seismic profiling, AHT: Anchor Handling Tug

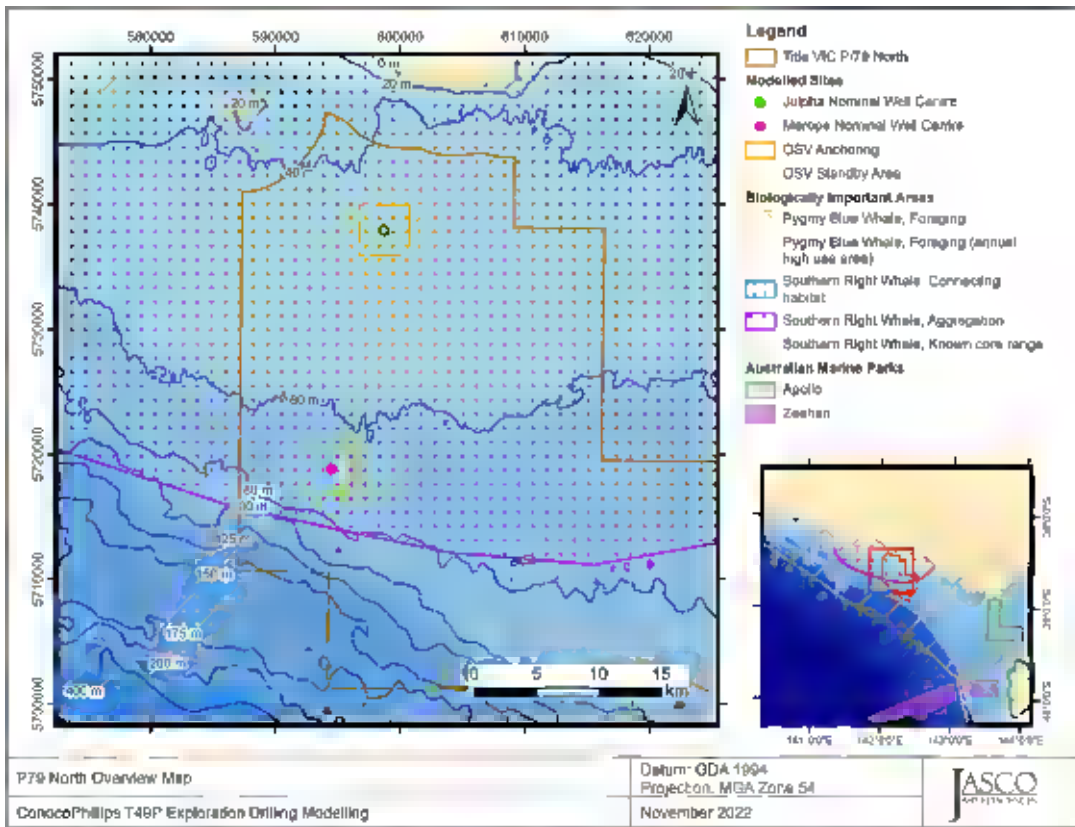


Figure 4. VIC/P79 – Northern extent overview map of the modelled extent and modelled sites. Receiver locations are listed in Table 8.

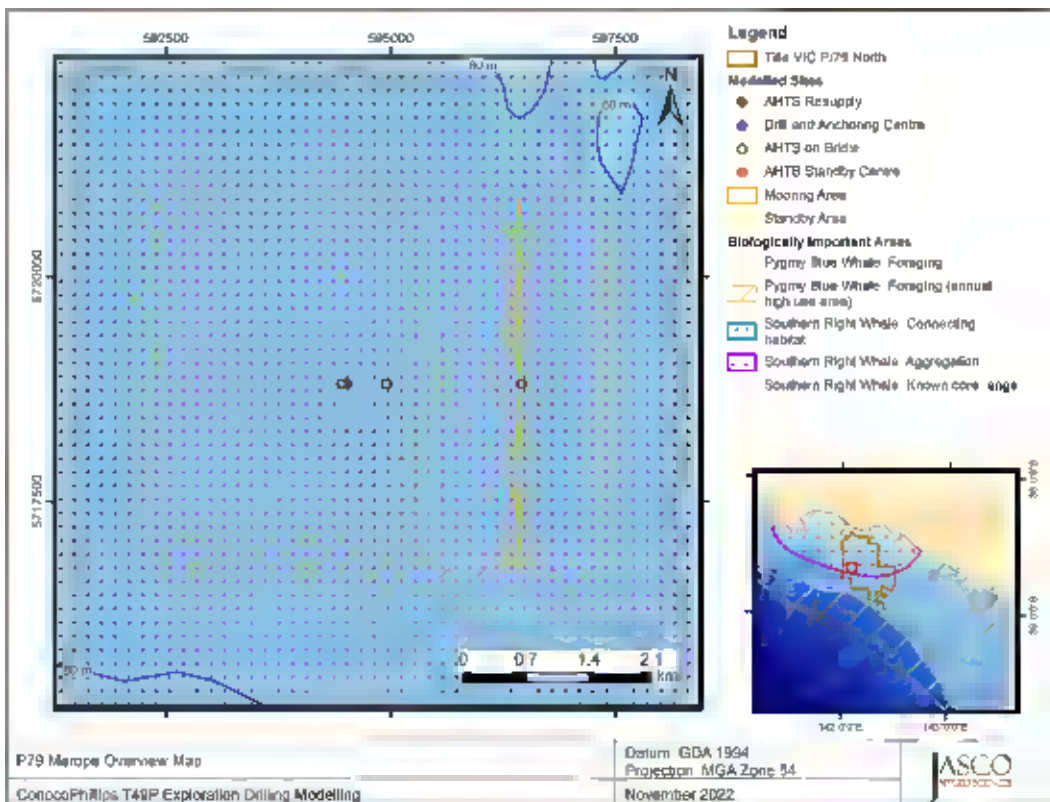


Figure 5. VIC/P79 – Northern extent Merope nominal well centre focused map showing drilling and vessel modelled features. Receiver locations are listed in Table 8

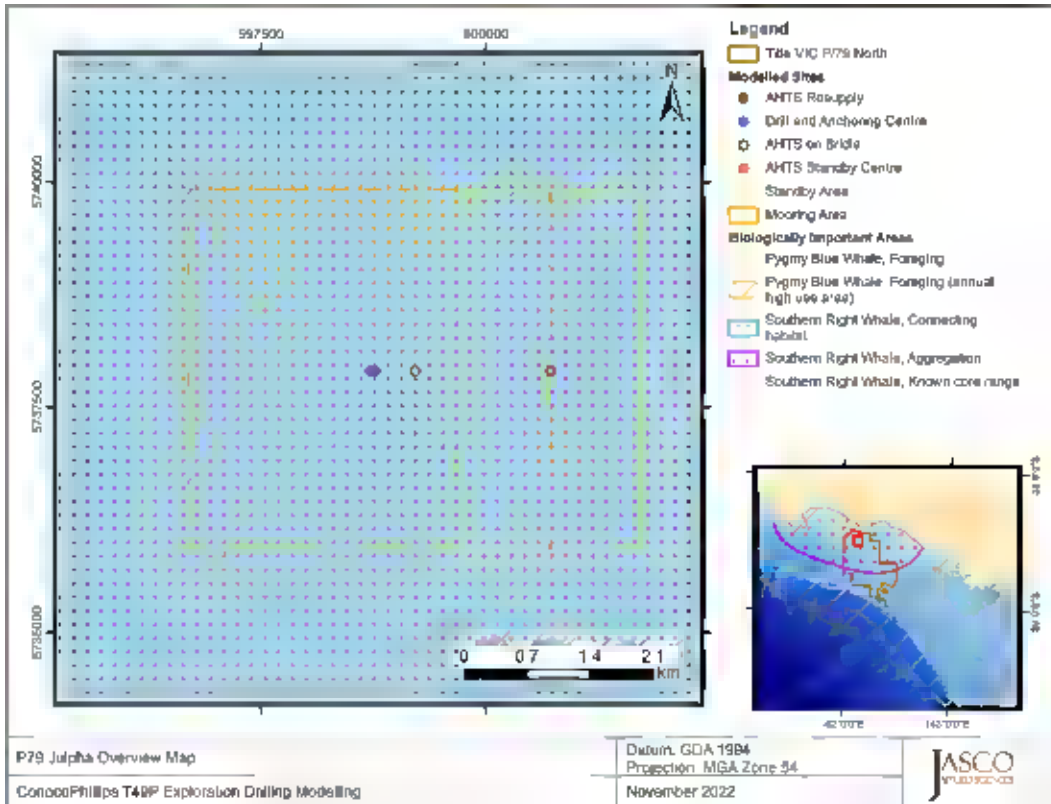


Figure 6. VIC/P79 – Northern extent Julpha nominal well centre focused map showing drilling and vessel modelled features.

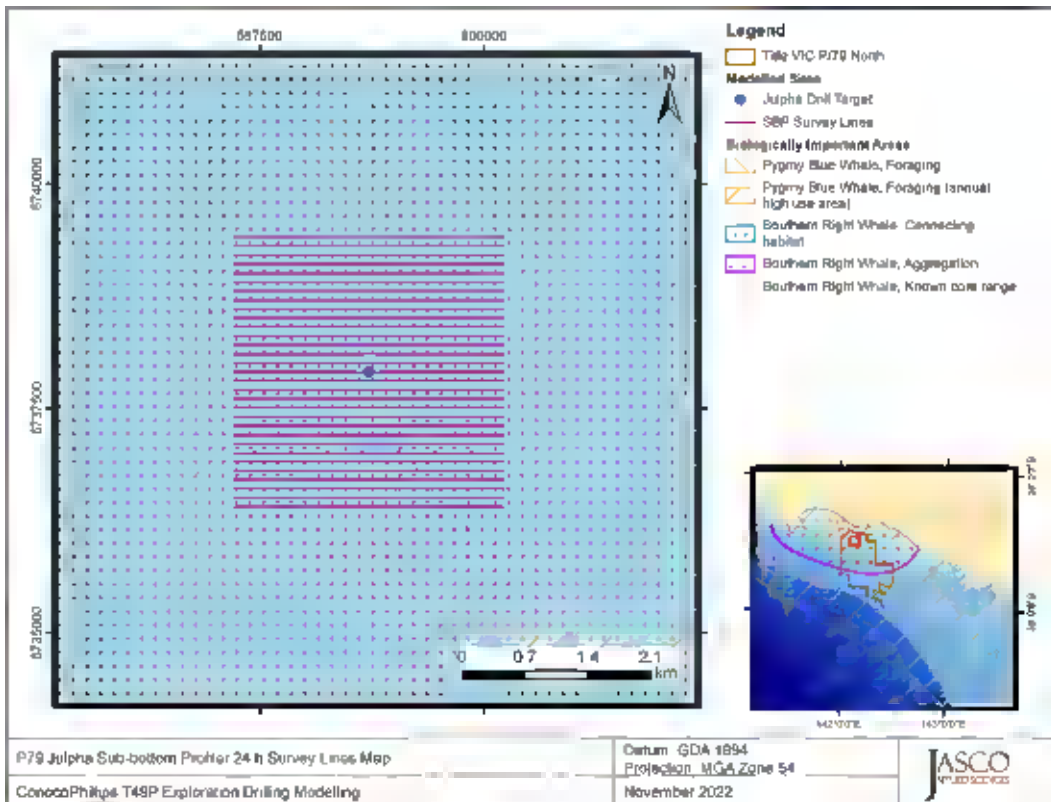


Figure 7. Sub-Bottom Profiler 24 h scenario survey lines at the Julpha nominal well centre.

Table 8. VIC/P79 Northern extent modelled locations and source information.

Location	Site	Source(s)	Latitude	Longitude	MGA Zone 54 (GDA94)		Water depth (m)
					X (m)	Y (m)	
Merope	MODU	<i>Ocean Onyx</i> (MODU)	38° 40' 27.4260" S	142° 05' 08.8764" E	594452	5718808	66
	Vessel at Bridle	Generic AHTS on Bridle DP	38° 40' 27.2351" S	142° 05' 29.5640" E	594952	5718808	64
	Supply vessel	Generic AHTS under DP	38° 40' 27.3406" S	142° 05' 11.2740" E	594510	5718810	65
	2 km east of MODU	Generic AHTS in transit	38° 40' 26.6512" S	142° 6' 31.6304" E	596452	5718808	65
Julpha	MODU	<i>Ocean Onyx</i> (MODU) VSP Array	38° 30' 06.3724" S	142° 07' 55.4875" E	598714	5737903	45
	Vessel at Bridle	Generic AHTS on Bridle DP	38° 30' 06.1724" S	142° 08' 16.1266" E	599214	5737903	46
	Supply vessel	Generic AHTS under DP	38° 30' 06.2844" S	142° 07' 57.8806" E	598772	5737905	46
	2 km east of MODU	Generic AHTS in transit	38° 30' 5.5663" S	142° 9' 18.0437" E	600714	5737903	49

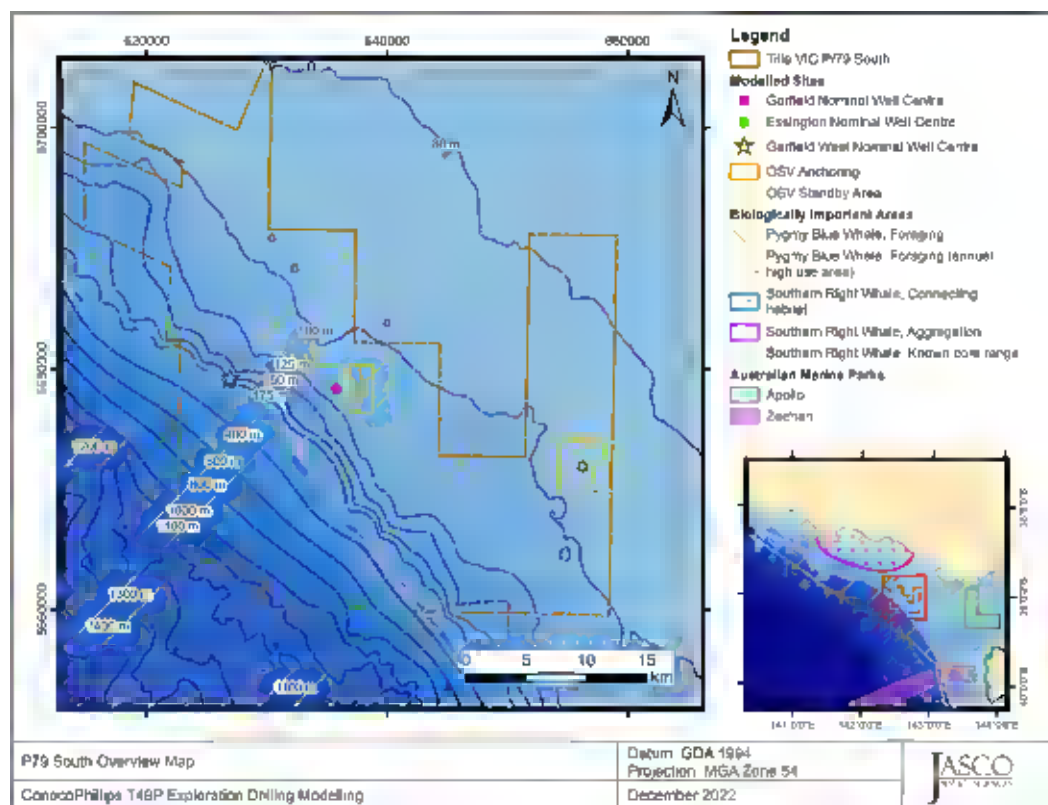


Figure 8. VIC/P79 – Southern extent overview map of the modelled extent and modelled sites.

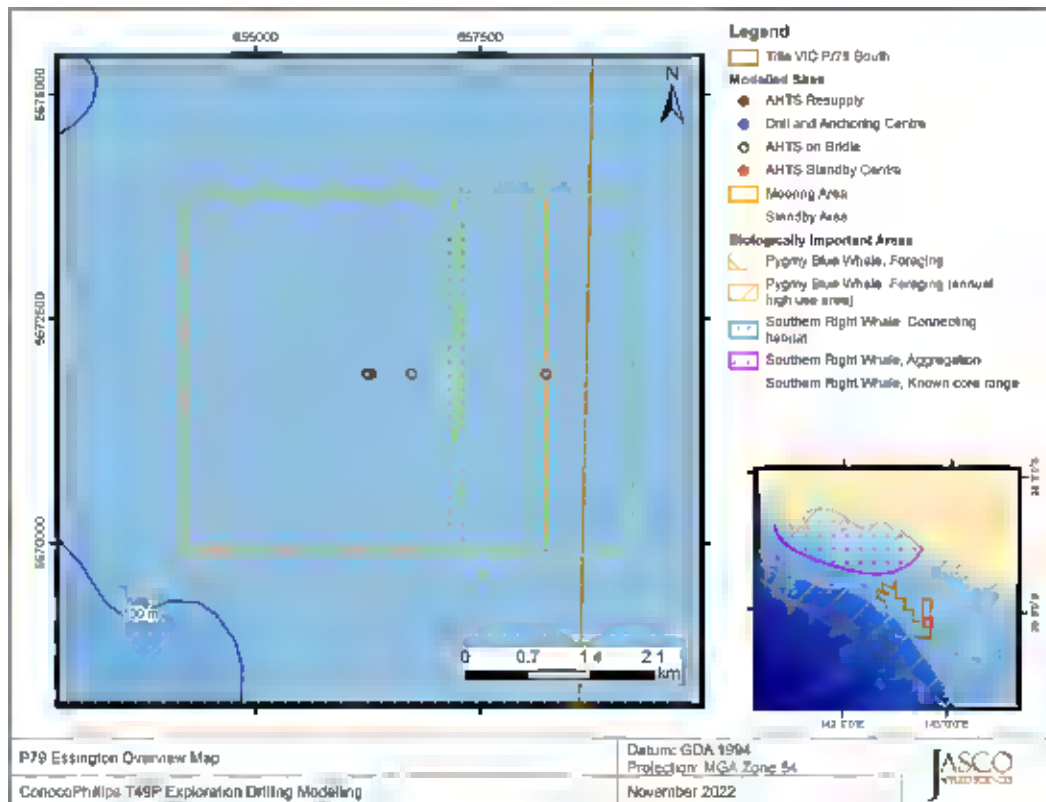


Figure 9. VIC/P79 – Southern extent Essington nominal drill target focused map showing modelled features.

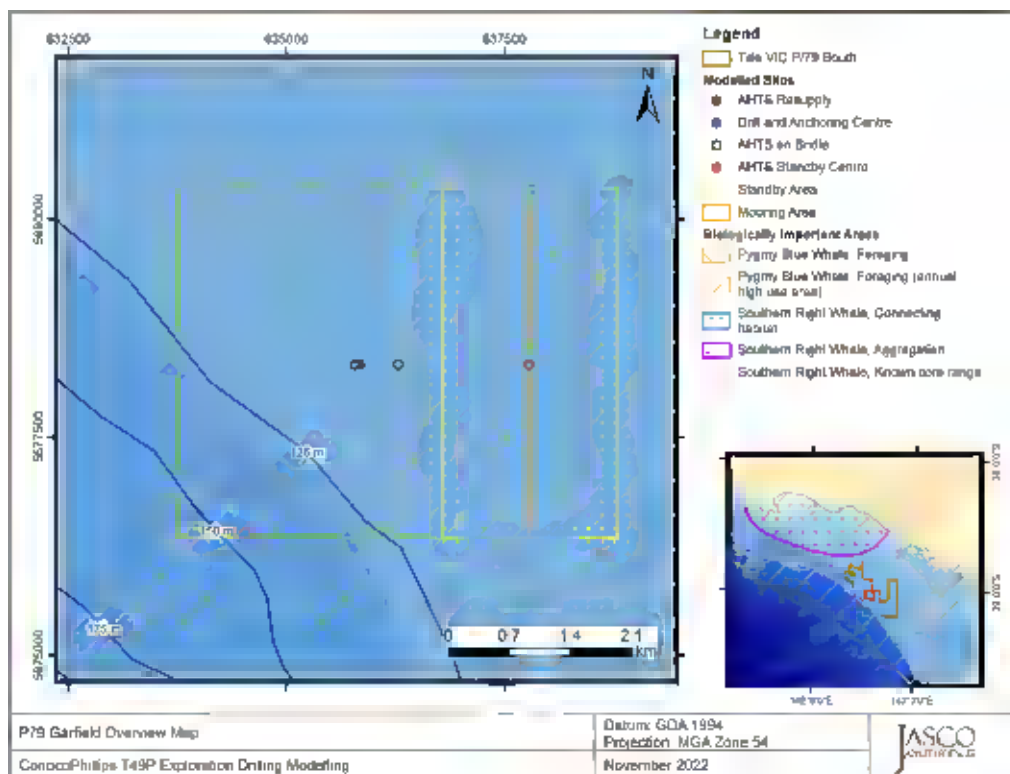


Figure 10. VIC/P79 – Southern extent Garfield nominal drill target focused map showing modelled features.

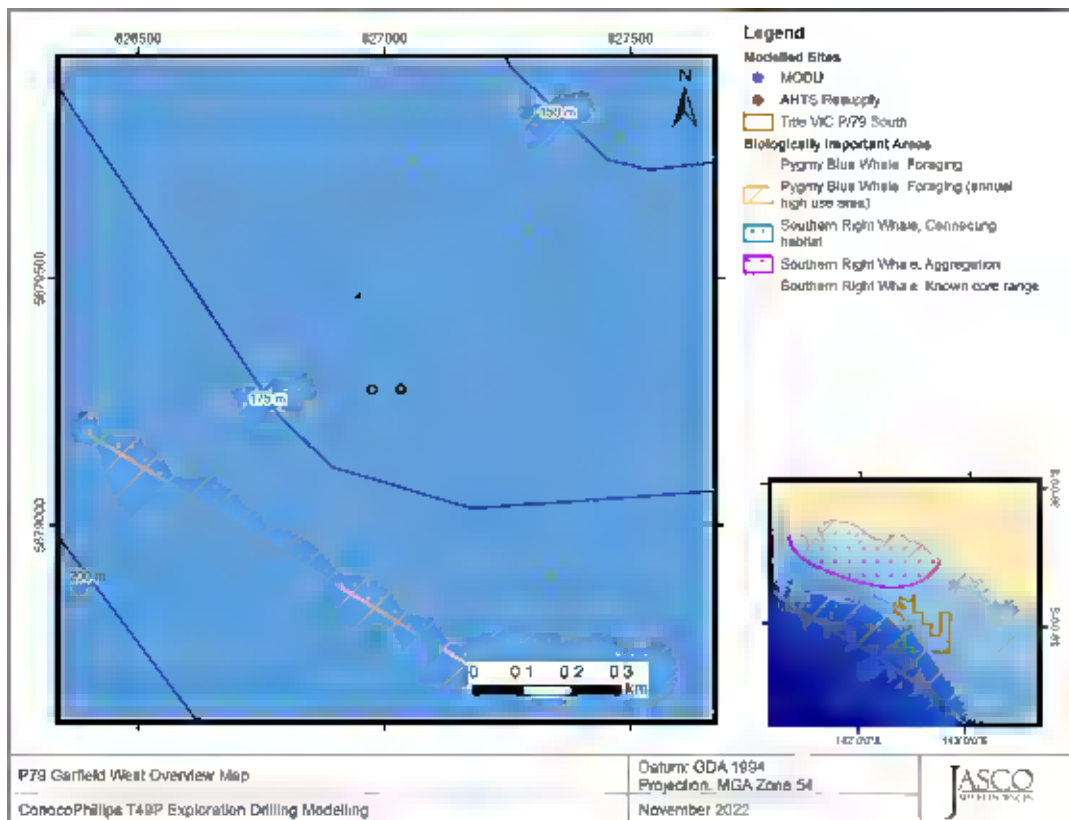


Figure 11. VIC/P79 – Southern extent Garfield West nominal drill target focused map showing modelled features.

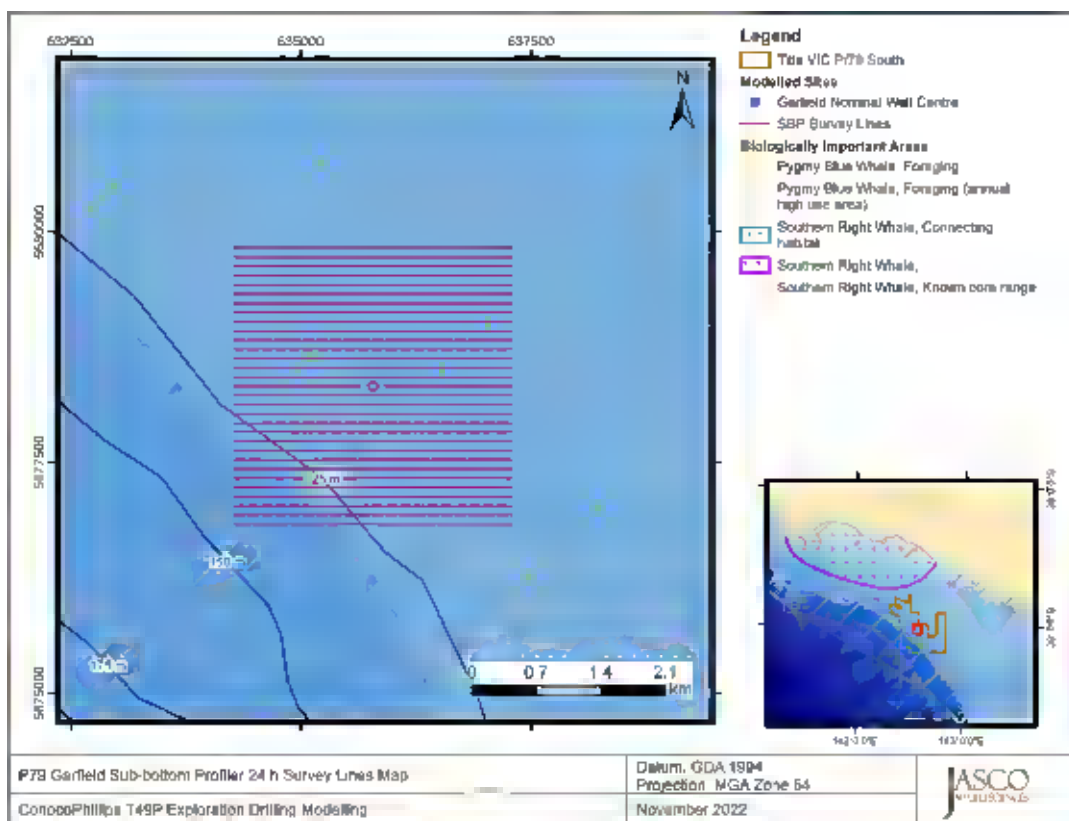


Figure 12. Sub-Bottom Profiler 24 h scenario survey lines at the Garfield nominal well centre.

Table 9. VIC/P79 Southern extent modelled locations and source information.

Location	Site	Source(s)	Latitude	Longitude	MGA Zone 54 (GDA94)		Water depth (m)
					X (m)	Y (m)	
Essington	MODU	<i>Ocean Onyx</i> (MODU)	39° 05' 17.4075" S	142° 48' 23.1485" E	656233	5671886	93
	Vessel at Bridle 33	Generic AHTS on Bridle DP	39° 05' 17.0845" S	142° 48' 43.9511" E	656733	5671886	92
	Supply vessel	Generic AHTS under DP	39° 05' 17.3052" S	142° 48' 25.5600" E	656290.9	5671888	93
	2 km east of MODU	Generic AHTS in transit	39° 5' 16.1097" S	142° 49' 46.3585" E	658233	5671886	96
Garfield	MODU	<i>Ocean Onyx</i> (MODU) VSP Array	39° 02' 00.8251" S	142° 34' 07.5289" E	635781	5678328	110
	Vessel at Bridle	Generic AHTS on Bridle DP	39° 02' 00.5488" S	142° 34' 28.3241" E	636281	5678328	108
	Supply vessel	Generic AHTS under DP	39° 02' 00.7317" S	142° 34' 09.9450" E	635839	5678330	110
	2 km east of MODU	Generic AHTS in transit	39° 1' 59.7021" S	142° 35' 30.6911" E	637781	5678328	110
Garfield West	MODU	<i>Ocean Onyx</i> (MODU)	39° 01' 34.8045" S	142° 28' 03.1585" E	626975	5679275	168
	Supply vessel	Generic AHTS at DP	39° 01' 34.8045" S	142° 28' 03.1585" E	627033	5679277	167

The modelled scenarios for non-impulsive sources are detailed in Table 10. A total of 14 scenarios to assess non-impulsive noise emission from vessel and drilling activities were initially modelled considering six combinations of activities for the drilling and vessel activities at each drill target within T/49P. The number of combinations of activities was then rationalised to 4 for modelling at VIC/P79 nominal locations as follows:

- For T/49P: Scenarios 1 to 6 were modelled at the nominal locations British Admiral and Flanagan; only Scenarios 3 and 4 were modelled at the British Admiral West location.
- For VIC/P79 – northern extent: Scenarios 1, 2, 5 and 6 were modelled at the nominal locations Merope and Julpha.
- For VIC/P79 – southern extent: Scenarios 1, 2, 5 and 6 were modelled at the nominal locations Essington and Garfield; only Scenarios 3 and 4 were modelled at the Garfield West location to provide a comparison between on-shelf and shelf-edge locations. Previous modelling for T49/P, and VIC/P79 has shown equal or comparable results between Scenarios 4 (drilling and resupply) and Scenario 6 (drilling, resupply and standby) with values modelled for Scenario 4 at Garfield West expected to represent the maximum effective distance.

Table 10. Description of vessel modelling scenarios and the associated sound source sites

Scenario	Site(s)		Source(s)	Description
	For computing SPL fields	For computing SEL fields		
1*	MODU	Random locations (24 h) within 4 × 4 km box centred on MODU	Generic AHTS	Prelay: 1 × anchor handler working on site within 2 km of location
2	Vessel at Bridle, 2 km east and 2 km west of MODU	Vessel at Bridle (24 h) and 2 sets of random locations (24 h), within 4 × 4 km box centred on MODU	3 × Generic AHTS	Mooring: Moored Semi-sub idle (no noise) 1 × anchor handler on the bridle on DP 2 × anchor handlers working on site within 2 km of location
3	MODU	MODU (24 h)	<i>Ocean Onyx</i>	Drilling: Anchored MODU drilling
4	MODU and Supply vessel	MODU (24 h) and Supply vessel (8 h)	<i>Ocean Onyx</i> Generic AHTS	Drilling and resupply: Anchored MODU drilling 1 × anchor handler at rig doing resupply (8 h)
5	MODU and 2 km east of MODU	MODU (24 h) and random locations (24 h), within 2 × 4 km box east of MODU	<i>Ocean Onyx</i> Generic AHTS	Drilling with standby vessel: Anchored MODU drilling 1 × anchor handler on standby within 2 km
6	MODU, Supply vessel, and 2 km east of MODU	MODU (24 h) and Supply vessel (8 h) and random locations (24 h), within 2 × 4 km box east of MODU	<i>Ocean Onyx</i> 2 × Generic AHTS	Drilling, resupply, with standby vessel: Anchored MODU drilling 1 × anchor handler on standby within 2 km 1 × anchor handler at rig doing resupply (8 h)

DP: Dynamic Positioning, MODU: Mobile Offshore Drilling Unit

The scenarios for impulsive VSP operation considered in this report varied by the maximum number of pulses per 24 h, up to a defined total of 130. The total number of pulses considered were 10, 50, 100, and 130 per 24 h at each location as described in Table 11.

Table 11. Description of vertical seismic profiling (VSP) scenarios.

Scenario	Location	Number of impulses
1	<i>British Admiral</i>	10
2		50
3		100
4		130
5	<i>Flanagan</i>	10
6		50
7		100
8		130
9	<i>Julpha</i>	10
10		50
11		100
12		130
13	Garfield	10
14		50
15		100
16		130

2. Noise Effect Criteria

To assess the potential effects of a sound-producing activity, it is necessary to first establish exposure criteria (thresholds) for which sound levels may be expected to have a negative effect on animals. Whether acoustic exposure levels might injure or disturb marine fauna is an active research topic. Since 2007, several expert groups have developed SEL-based assessment approaches for evaluating auditory injury, with key works including Southall et al. (2007), Finneran and Jenkins (2012), Popper et al. (2014), United States National Marine Fisheries Service (NMFS 2018) and Southall et al. (2019). The number of studies that investigate the level of behavioural disturbance to marine fauna by anthropogenic sound has also increased substantially.

Two sound level metrics, SPL, and SEL, are commonly used to evaluate non-impulsive noise and its effects on marine life. In this report, the duration of the SEL accumulation is defined as integrated over a 24 h time period. Appropriate subscripts indicate any applied frequency weighting applied (Appendix 0). The acoustic metrics in this report reflect the updated ANSI and ISO standards for acoustic terminology, ANSI S1.1 (S1.1-2013) and ISO 18405:2017 (2017).

The following thresholds and guidelines for this study were chosen because they represent the best available science, and sound levels presented in literature for fauna with no defined thresholds:

1. Peak pressure levels (PK; L_{pk}) and frequency-weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) from Southall et al. (2019) for the onset of permanent threshold shift (PTS) and temporary threshold shift (TTS) in marine mammals for non-impulsive and impulsive sources.
 - a. Weighted SPL for assessing more nuanced responses to impulsive noise for migrating Southern Right whales (SRW) from Wood et al. (2012).
2. Marine mammal behavioural threshold based on the current interim US National Oceanic and Atmospheric Administration (NOAA) (2019) criterion for marine mammals of 120 dB re 1 μ Pa (SPL; L_p) and 160 dB re 1 μ Pa (SPL; L_p) for non-impulsive and impulsive sound sources.
3. Sound exposure guidelines for fish, fish eggs, and larvae (Popper et al. 2014).
4. Peak pressure levels (PK; L_{pk}) and frequency-weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) from Finneran et al. (2017) for the onset of permanent threshold shift (PTS) and temporary threshold shift (TTS) in turtles.
5. Peak-peak pressure levels (PK-PKS; L_{pk-pk}) at the seafloor to help assess effects of noise on crustaceans through comparing to results in Day et al. (2016a), Day et al. (2019), Day et al. (2016b), Day et al. (2017) and Payne et al. (2008).

Sections 2.1 and 2.2, along with Appendices A.3 and A.4, expand on the thresholds, guidelines, and sound levels for marine mammals, fish, fish eggs, fish larvae, and sea turtles.

2.1. Marine Mammals

The criteria applied in this study to assess possible effects of non-impulsive and impulsive noise sources on marine mammals are summarised in Tables 12 and 13. Cetaceans and otariid seals were identified as the hearing groups requiring assessment. Details on thresholds related to auditory threshold shifts or hearing loss and behavioural response are provided in Appendix A.3, with frequency weighting explained in detail in Appendix A.4. Of particular note, whilst the newly published Southall et al. (2021) provides recommendations and discusses the nuances of assessing behavioural response, the authors do not recommend new numerical thresholds for onset of behavioural responses for marine mammals.

To assist in assessing potential behavioural responses by migrating SRW, a graded probability of response for impulsive sounds using a frequency weighted SPL metric, as described in Wood et al. (2012), has been applied. Wood et al. (2012) defined behavioural response categories for sensitive species (including harbour porpoise and beaked whales) and for migrating mysticetes. The migrating

mysticete category has been applied to Southern Right Whales in this analysis, within the calving and calving buffer BIAs and also during migration, to assess behavioural response to impulsive sounds (Table 14). The Wood et al. (2012) approach has been updated to consider the frequency weighting from Southall et al. (2019) for low-frequency cetaceans as opposed to that from Southall et al. (2007).

Table 12. Criteria for effects of non-impulsive noise exposure, including vessel noise, for marine mammals: Unweighted sound pressure level (SPL) and 24 h sound exposure level (SEL_{24h}) thresholds.

Hearing group	NOAA (2019)	Southall et al. (2019)	
	Behaviour	PTS onset thresholds (received level)	TTS onset thresholds (received level)
	SPL (L_p ; dB re 1 μ Pa)	Weighted SEL _{24h} ($L_{E,24h}$; dB re 1 μ Pa ² ·s)	Weighted SEL _{24h} ($L_{E,24h}$; dB re 1 μ Pa ² ·s)
Low-Frequency (LF) cetaceans	120	199	179
High-frequency (HF) cetaceans		198	178
Very high-frequency (VHF) cetaceans		173	153
Otariid seals		219	199

L_p denotes sound pressure level period and has a reference value of 1 μ Pa.

L_E denotes cumulative sound exposure over a 24 h period and has a reference value of 1 μ Pa²·s.

Table 13. Acoustic effects of impulsive noise on marine mammals: Unweighted sound pressure level (SPL), 24 h sound exposure level (SEL_{24h}), and peak (PK) thresholds.

Hearing group	NOAA (2019)	Southall et al. (2019)			
	Behaviour	PTS onset thresholds ^a (received level)		TTS onset thresholds ^a (received level)	
	SPL (L_p ; dB re 1 μ Pa)	Weighted SEL _{24h} ($L_{E,24h}$; dB re 1 μ Pa ² ·s)	PK (L_{pk} ; dB re 1 μ Pa)	Weighted SEL _{24h} ($L_{E,24h}$; dB re 1 μ Pa ² ·s)	PK (L_{pk} ; dB re 1 μ Pa)
Low-Frequency (LF) cetaceans	160	183	219	168	213
High-frequency (HF) cetaceans		185	230	170	224
Very high-frequency (VHF) cetaceans		155	202	140	196
Otariid seals		183	232	168	226

^a Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

L_p denotes sound pressure level period.

$L_{pk,flat}$ denotes peak sound pressure is flat weighted or unweighted.

L_E denotes cumulative sound exposure over a 24 h period.

Table 14. Behavioural response criteria used in this analysis for calving and migrating Southern Right Whale (SRW) probability of behavioural response frequency-weighted sound pressure level (SPL, dB re 1 μ Pa). Probabilities are not additive. Adapted from Wood et al. (2012).

Frequency-weighted SPL ($L_{p,LF}$; dB re 1 μ Pa) ^a	Probability of response (%)
120	10
140	50
160	90

^a Low-frequency cetacean weighted, Southall et al. (2019).

2.2. Fish, Sea turtles, Fish Eggs, and Fish Larvae

In 2006, the Working Group on the Effects of Sound on Fish and Sea Turtles was formed to continue developing noise exposure criteria for fish and sea turtles, work begun by a NOAA panel two years earlier. The Working Group developed guidelines with specific thresholds for different levels of effects for several species groups (Popper et al. 2014). The guidelines define quantitative thresholds for three types of immediate effects:

- Mortality, including injury leading to death,
- Recoverable injury, including injuries unlikely to result in mortality, such as hair cell damage and minor haematoma, and
- TTS.

Masking and behavioural effects can be assessed qualitatively, by assessing relative risk rather than by specific sound level thresholds. However, as these depend upon activity-based subjective ranges, these effects are not addressed in this report and are included in Tables 17 and 15 for completeness only. Because the presence or absence of a swim bladder has a role in hearing, fish's susceptibility to injury from noise exposure depends on the species and the presence and possible role of a swim bladder in hearing. Thus, different thresholds were proposed for fish without a swim bladder (also appropriate for sharks and applied to whale sharks in the absence of other information), fish with a swim bladder not used for hearing, and fish that use their swim bladders for hearing. Sea turtles, fish eggs, and fish larvae are considered separately.

Table 15 lists the relevant effects thresholds from Popper et al. (2014) for vessel and drilling noise. Some evidence suggests that fish sensitive to acoustic pressure show a recoverable loss in hearing sensitivity, or injury when exposed to high levels of noise (Scholik and Yan 2002, Amoser and Ladich 2003, Smith et al. 2006); this is reflected in the SPL thresholds for fish with a swim bladder involved in hearing. There is a paucity of data regarding responses of turtles to acoustic exposure, and no studies of hearing loss due to exposure to loud sounds. Popper et al. (2014) suggested thresholds for onset of mortal injury (including PTS) and mortality for sea turtles and, in absence of taxon-specific information, adopted the levels for fish that do not hear well (suggesting that this likely would be conservative for sea turtles). Finneran et al. (2017) presented revised thresholds for turtle injury considering frequency weighted SEL, which have been applied in this study for vessels and drilling noise (Table 16). Their rationale is that sea turtles have best sensitivity at low frequencies and are known to have poor auditory sensitivity (Bartol and Ketten 2006, Dow Piniak et al. 2012). Accordingly, TTS and PTS thresholds for turtles are likely more similar to those of fishes than to marine mammals (Popper et al. 2014).

Table 15. Criteria for non-impulsive (vessel and drilling) noise exposure for fish, adapted from Popper et al. (2014).

Type of animal	Mortality and Potential mortal injury	Impairment			Behaviour
		Recoverable injury	TTS	Masking	
Fish: No swim bladder (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: Swim bladder not involved in hearing (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: Swim bladder involved in hearing (primarily pressure detection)	(N) Low (I) Low (F) Low	170 dB SPL for 48 h	158 dB SPL for 12 h	(N) High (I) High (F) High	(N) High (I) Moderate (F) Low
Sea turtles	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) High (I) Moderate (F) Low
Fish eggs and fish larvae	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) Moderate (I) Moderate (F) Low

Sound pressure level dB re 1 µPa.

Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

Table 16. Acoustic effects of non-impulsive noise on sea turtles, weighted 24 h sound exposure level (SEL_{24h}), Finneran et al. (2017).

PTS onset thresholds ^a (received level)	TTS onset thresholds ^a (received level)
220	200

^a L_E, cumulative sound exposure over a 24 h period, with a reference value of 1 µPa²·s.

Impulsive noise from airguns (i.e., from VSP) and the SBP was assessed in this study based on the relevant effects thresholds from Popper et al. (2014) listed in Table 17. In general, whether an impulsive sound adversely effects fish behaviour depends on the species, the state of the individual exposed, and other factors.

The SEL metric integrates noise intensity over some period of exposure. Because the period of integration for regulatory assessments is not well defined for sounds that do not have a clear start or end time, or for very long-lasting exposures, an exposure evaluation time must be defined. Southall et al. (2007) defines the exposure evaluation time as the greater of 24 h or the duration of the activity. Popper et al. (2014) recommend a standard period of the duration of the activity; however, the publication also includes caveats about considering the actual exposure times if fish move. Integration times in this study for VSP and SBP operations have been applied over the total number of impulses per day.

Table 17. Criteria for seismic noise exposure for fish, adapted from Popper et al. (2014).

Type of animal	Mortality and Potential mortal injury	Impairment			Behaviour
		Recoverable injury	TTS	Masking	
Fish: No swim bladder (particle motion detection)	> 219 dB SEL _{24h} or > 213 dB PK	> 216 dB SEL _{24h} or > 213 dB PK	>> 186 dB SEL _{24h}	Seismic: (N, I, F) Low	(N) High (I) Moderate (F) Low
Fish: Swim bladder not involved in hearing (particle motion detection)	210 dB SEL _{24h} or > 207 dB PK	203 dB SEL _{24h} or > 207 dB PK	>> 186 dB SEL _{24h}	Seismic: (N, I, F) Low	(N) High (I) Moderate (F) Low
Fish: Swim bladder involved in hearing (primarily pressure detection)	207 dB SEL _{24h} or > 207 dB PK	203 dB SEL _{24h} or > 207 dB PK	186 dB SEL _{24h}	Seismic: (N, I) Low (F) Moderate	(N, I) High (F) Moderate
Fish eggs and fish larvae	> 210 dB SEL _{24h} or > 207 dB PK	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low	Seismic: (N, I, F) Low	(N) Moderate (I, F) Low

Peak sound pressure level dB re 1 μ Pa; SEL_{24h} dB re 1 μ Pa²·s.

All criteria are presented as sound pressure even for fish without swim bladders since no data for particle motion exist. Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

McCauley et al. (2000a) observed the behavioural response of caged sea turtles—green (*Chelonia mydas*) and loggerhead (*Caretta caretta*)—to an approaching seismic airgun. For received levels above 166 dB re 1 μ Pa (SPL), the sea turtles increased their swimming activity, and above 175 dB re 1 μ Pa they began to behave erratically, which was interpreted as an agitated state. The Recovery Plan for Marine Turtles in Australia (Department of the Environment and Energy et al. 2017) acknowledges the 166 dB re 1 μ Pa SPL reported (McCauley et al. 2000a) as the level that may result in a behavioural response to marine turtles. The 175 dB re 1 μ Pa level from McCauley et al. (2000a) is recommended as a criterion for behavioural disturbance. These thresholds are shown in Table 18.

Table 18. Acoustic effects of impulsive noise on sea turtles: Unweighted sound pressure level (SPL), 24 h sound exposure level (SEL_{24h}), and peak pressure (PK) thresholds.

Effect type	Criterion	SPL (L_p ; dB re 1 μ Pa)	Weighted SEL _{24h} ($L_{E,24h}$; dB re 1 μ Pa ² ·s)	PK (L_{pk} ; dB re 1 μ Pa)
Behavioural response	McCauley et al. (2000a)	166	NA	
Behavioural disturbance		175		
PTS onset thresholds ^a (received level)	Finneran et al. (2017)	NA	204	232
TTS onset thresholds ^a (received level)		NA	189	226

^a Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS and TTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

L_p denotes sound pressure level period and has a reference value of 1 μ Pa.

$L_{pk,flat}$ denotes peak sound pressure is flat weighted or unweighted and has a reference value of 1 μ Pa.

L_E denotes cumulative sound exposure over a 24 h period and has a reference value of 1 μ Pa²·s.

2.3. Invertebrates

Research is ongoing into the relationship between sound and its effects on crustaceans, including the relevant metrics for both effect and impact. Available literature suggests particle motion, rather than sound pressure, is a more important factor for crustacean and bivalve hearing. Water depth and seismic source size are related to the particle motion levels at the seafloor, with larger arrays and shallower water being related to higher particle motion levels, more likely relevant to effects on crustaceans and bivalves. Information is only available to define levels for assessment for impulsive sources.

At the seafloor interface, crustaceans and bivalves are subject to particle motion stimuli from several acoustic or acoustically induced waves. These include the particle motion associated with an impinging sound pressure wave in the water column (the incident, reflected, and transmitted portions), substrate acoustic waves, and interface waves of the Scholte type. However, it is unclear which aspect(s) of these waves is/are most relevant to the animals, either when they normally sense the environment or their physiological responses to loud sounds so there is not enough information to establish similar criteria and thresholds as done for marine mammals and fish. Including recent research, such as Day et al. (2016b), current literature does not clearly define an appropriate metric or identify relevant levels (pressure or particle motion) for an assessment. This includes the consideration of what particle motion levels lead to a behavioural response, or mortality. Therefore, at this stage, we cannot propose authoritative thresholds to inform the impact assessment. However, levels can be determined for pressure metrics presented in literature to assist the assessment.

The pressure and acceleration examples provided in Day et al. (2016a) as their Figures 11 and 12 indicate that the acceleration and pressure signals occurred simultaneously, which was interpreted as an indication that the waterborne sounds were responsible for the accelerations measured by the geophones. For clarity, it is important to distinguish that the acceleration from waterborne sound energy is not ground roll, which Day et al. (2016a) correctly define as the sound that propagates along the interface at a speed lower than the shear wave speed of the sediment. However, the report subsequently uses ground roll for all further discussions of particle acceleration. While Day et al. (2016a) discuss that they chose the simplest measure of ground roll, it should have been referred to as “the acceleration from waterborne sound energy”, or ‘waterborne acceleration’ for short.

For crustaceans, a PK-PK sound level of 202 dB re 1 μ Pa (Payne et al. 2008) is considered to be associated with no effect, and it was therefore applied in this assessment. Additionally for context related to different levels of potential impairment, the PK-PK sound levels determined for crustaceans in Day et al. (2016b), 209–212 dB re 1 μ Pa and 213 dB re 1 μ Pa from Day et al. (2019), are also included.

3. Methods and Parameters

The following sections provided a high-level description of the inputs used for this underwater noise modelling study. The sections are divided into subsections detailing the source inputs for the MODU and AHTS (Section 3.1), the VSP array (Section 3.2), and the SBP (Section 3.3), with Section 3.4 providing the details on the applied modelling technique and model configuration information.

3.1. Vessel and Drilling Noise Sources

3.1.1. Mobile Offshore Drilling Unit (MODU)

The MODU, or semi-submersible platform considered by ConocoPhillips will likely be similar to the *Ocean Onyx*, (Figure 13), therefore this is the MODU considered in the modelling. While in operation, the MODU will be held in position via anchors and chains, as opposed to using thrusters. Underwater sound from the platform while drilling is expected to originate primarily from onboard equipment vibrations, while a smaller portion of the sound is expected to be transmitted directly into the water via the vibrating drill (Austin et al. 2018). Since the dominant vibration sources (e.g., pumps, generators, and machinery) are located on or below the main deck of the platform, the modelled depth of the point source representing the MODU was set to 11.6 m, which is approximately half the draft of the *Ocean Onyx*.

The *Ocean Onyx* (Figure 13) was measured by JASCO while anchored and drilling (McPherson et al. 2021). It had a broadband (10 Hz to 31 kHz) source level of 175.4 dB re 1 $\mu\text{Pa} \cdot \text{m}^2 \cdot \text{s}$.

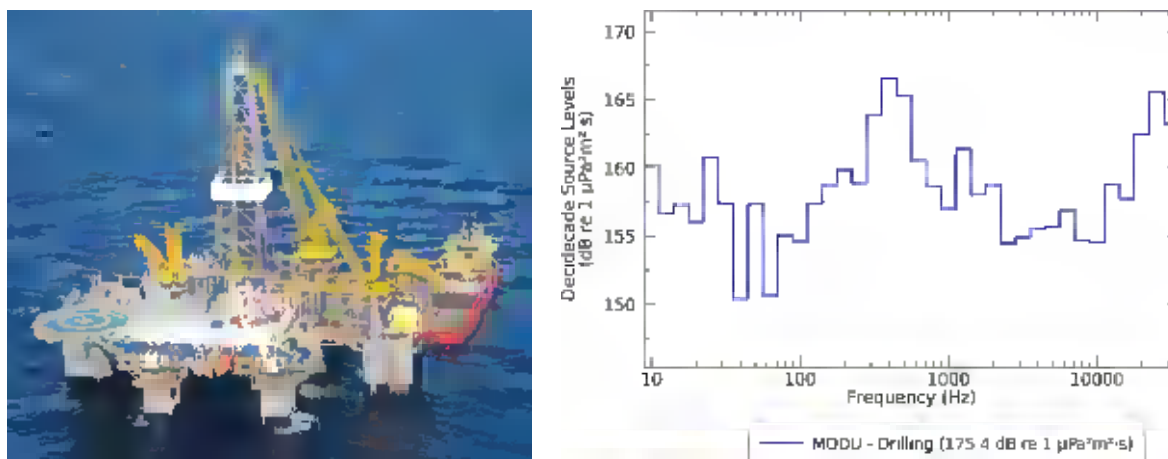


Figure 13. (Left) Photo of the *Ocean Onyx* semi-submersible platform and (right) the associated decidecade source level spectrum.

3.1.2. Anchor Handling Tug Supply (AHT) Vessel

Underwater sound that radiates from vessels is produced mainly by propeller and thruster cavitation, with a smaller fraction of noise produced by sound transmitted through the hull, such as by engines, gearing, and other mechanical systems. Sound levels tend to be the highest when thrusters are used to position the vessel and when the vessel is transiting at high speeds. A vessel’s sound signature depends on the vessel’s size, power output, propulsion system (e.g., conventional propellers versus Voith Schneider propulsion), and the design characteristics of the given system (e.g., blade shape and size). A vessel produces broadband acoustic energy with most energy emitted below a few kilohertz. Sound from onboard machinery, particularly sound below 200 Hz, dominates the sound spectrum before cavitation begins (Spence et al. 2007).

At this stage, the exact vessel specifications as well as the precise operational scenarios are not known. As such, estimates of the source levels for support vessel operations were based on a generic design of an Anchor Handling Tug Supply (AHTS) vessel. The generic AHTS vessel was based on the Siem AHTS VS491 CD design (Figure 14) and its specifications (Siem Offshore 2010) were used to form a basis for vessel source level estimation and source depth for acoustic modelling purposes. The general specification of these vessels is that they have a bollard pull of 285–310 t, and an overall length, beam, and draft of 91.0, 22.0, and 7.95 m, respectively.

The measured monopole source levels (MSLs) and spectra for the AHTS were from McPherson et al. (2021). For scenarios where the AHTS was under dynamic positioning (DP), the spectra from Section 5.5.2 in McPherson et al. (2021) were used.

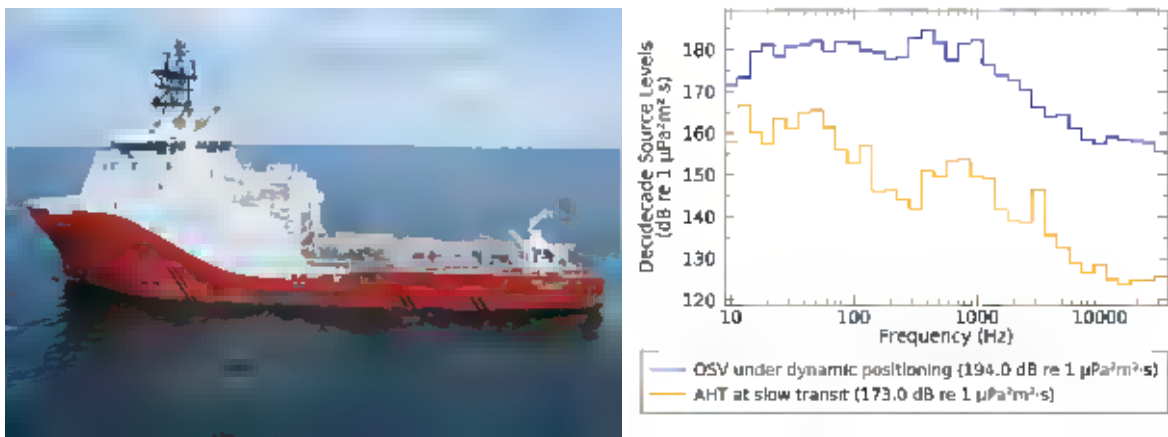


Figure 14. (Left) Photo of an Anchor Handling Tug Supply (AHTS) vessel and (right) the associated decidecade source level spectra (Photo source: Siem Offshore 2010).

3.2. Vertical Seismic Profiling Acoustic Source

The pressure signature of the individual airguns and the composite decade band point-source equivalent directional levels (i.e., source levels) of the 750 in³ Vertical Seismic Profiling (VSP) source suspended at 5 m were modelled with JASCO's Airgun Array Source Model (AASM; see Appendix B).

3.2.1. Acoustic Source Model

AASM accounts for the notional pressure signatures of each source element with respect to the effects of surface-reflected signals on bubble oscillations and inter-bubble interactions, the surface-reflected signal (known as surface ghost) is not included in the far-field source signatures. The acoustic propagation models account for those surface reflections, which are a property of the propagating medium rather than the source. AASM considers:

- Array layout;
- Volume, depth, and firing pressure of each airgun; and
- Interactions between different airguns in the array.

3.3. Boomer Sub-bottom Profiling Acoustic Source

Sub-Bottom Profiling (SBP) systems are used to determine the physical properties of the seabed and to image and characterise geological information below the seabed and evaluate the near-seabed stratigraphy for hazards. SBP utilises an acoustic source typically towed just behind the vessel, with a hydrophone towed approximately 25 m behind the vessel to record the reflected sound waves.

Different SBP systems (pinger, compressed high intensity radar pulse (CHIRP) and boomer/sparker systems) are used depending on the objectives of the survey, water depths and prior knowledge of seabed geology with the main difference between each SBP system being the operating frequency.

The representative boomer system chosen for geophysical survey operations is the AP3000 triple-plate boomer (manufactured by Subsea Systems, Inc.). To estimate the sound field for the boomer source, the specifications of the Applied Acoustics AA202 boomer plate (Applied Acoustics Engineering 2013), a suitable approximation, were taken to represent a single plate, three of which comprise the full system. The boomer plate is 38 cm wide by 38 cm long with a circular baffle. Because the boomer source is a circular piston surrounded by a rigid baffle, it cannot be considered a point-like source (Verbeek and McGee 1995). The beam pattern of a boomer plate shows some directivity for frequencies above 1 kHz. Above this frequency, the acoustic wave's emitted length becomes comparable (of the same order of magnitude) with the baffle size (< 150 cm vs. 35 cm).

The input energy for the AP3000 system is up to 600 J per pulse per plate, or up to 1,800 J per pulse from all three plates. The width of the pulse calculated based on the 90% SPL (T_{90}) is 8.1 ms.

JASCO performed a source verification study on an AP3000 system (Martin et al. 2012) with a double-plate configuration operating at maximum input energy of 1000 J. During the study, the acoustic data were collected as close as 8 m to the source and directly below it (Figure 15). The power spectrum of the boomer signal was determined directly from the measurement of the boomer signal having compensated the change in energy (Figure 16). The sound levels were back-propagated to obtain source levels using a geometrical approximation based on the method of images and plane-wave reflection coefficients. The reflection coefficients considered seabed attenuation and shear properties, as well as the seabed layering.

The increase in the source level of an AP3000 boomer when in triple-plate configuration, instead of double-plate configuration, was estimated at 2.6 dB because a triple-plate configuration could be used

with a higher energy input per pulse (up to 1800 J vs. up to 1000 J for double plate configuration). For modelling, the source level of the AP3000 triple-plated boomer operating at 1800 J per pulse energy was calculated to be 169.0 dB $1 \mu\text{Pa}^2\text{m}^2\text{s}$ (Table 19). The 1/3-octave frequency boomer source spectra are shown in Figure 17. Boomer source spectra calculated from measurements (Martin et al. 2012).

Table 19. Specifications of the AP3000 triple-plate boomer system towed at a depth of 2 m used for the modelling

Specification	Specification	Source
Operating frequency (broad band):	200 Hz–16 kHz;	Estimated from field measurements; Martin et al. (2012)
Beam width	omnidirectional -8°	System specification document
Beams	1	
Tilt angle (below horizontal plane)	90°	
Maximum energy input (per pulse):	1800 J	
Per-pulse SEL source level	169.0 dB $1 \mu\text{Pa}^2\text{m}^2\text{s}$	Estimated from field measurements; Martin et al. (2012).

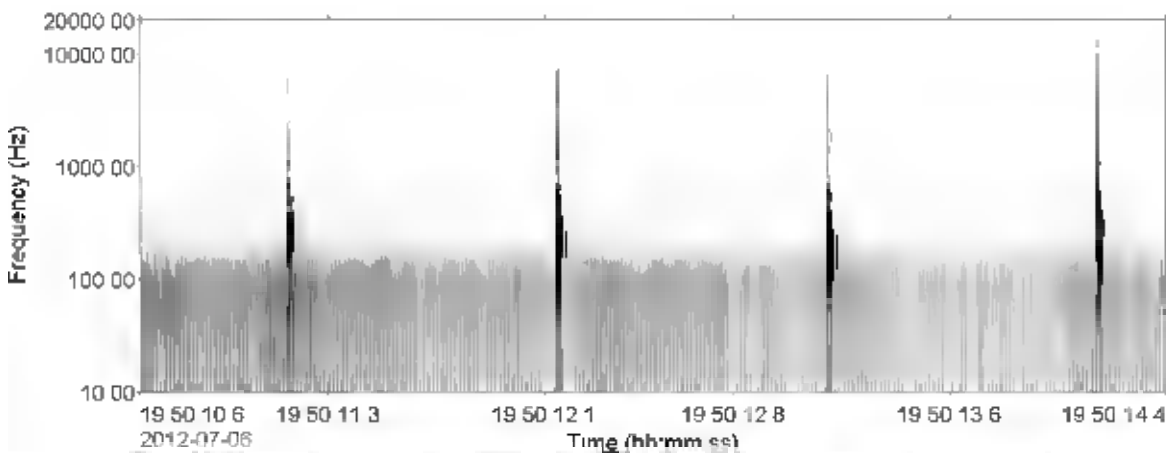


Figure 15. Spectrogram of dual-plate boomer (1000 J) pulses at the closest point of approach. Majority of energy is between 100 and 1000 Hz, with some energy at up to 10 kHz. (131,072 point FFT, 7000 data points, 3500 point overlap, Figure 15 in Martin et al. (2012)).

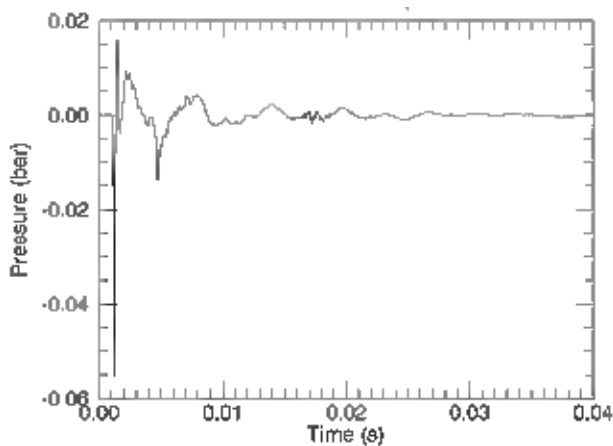


Figure 16. Boomer received timeseries (adjusted to 1800 J), where source depth is 2 m, receiver depth is 8 m, from the measurement Martin et al. (2012).

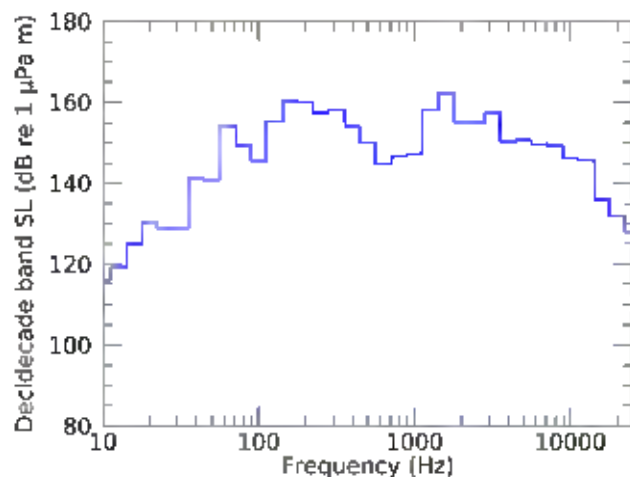


Figure 17. Boomer source spectra calculated from measurements (Martin et al. 2012).

3.4. Geometry and Modelled Regions

Several fit-for-purpose propagation models were used to model underwater noise emission from the scenarios considered for this study. Details on the model configuration is provided below.

The accuracy of the broadband calculated propagation loss for the Otway Basin continental shelf environment depends significantly upon the frequency content of the radiating sound source together with thickness of the sand layer on carbonate seabed (calcareenite) likely to occur within the region. In general, the thinner the sand layer, the greater the overall propagation loss. A measurement study in the Otway Basin of the *Ocean Onyx* and associated activities was previously undertaken (McPherson et al. 2021). This study found significant rates of propagation loss occurred in the region. As part of the model-measurement validation an adjustment factor was applied broadband received level predictions to account for the loss associated with a cemented limestone seabed (calcareenite). A similar adjustment, which only differed by accounting for sources in different water depths, was applied to broadband level predictions in this study as a very similar type of seabed environment is expected to be present.

3.4.1. Sound Propagation Models

Three sound propagation models were used to predict the acoustic field around the seismic source:

- Combined range-dependent parabolic equation and Gaussian beam acoustic ray-trace model (MONM-BELLHOP, see Appendix D.1.2, 10 Hz to 25 kHz).
- Full Waveform Range-dependent Acoustic Model (FWRAM, see Appendix D.1.3, 10 to 1024 Hz).
- Wavenumber integration model (VSTACK, see Appendix D.1.4, 10 to 1024 Hz).

3.4.2. Vessel and Drilling Noise

JASCO's Marine Operations Noise Model (MONM-BELLHOP; see Appendix D.1.2) was used to predict the acoustic field at frequencies of 10 Hz to 25 kHz for all vessel sources. To supplement the MONM results, high-frequency results for propagation loss were modelled using Bellhop for frequencies from 1.26 to 25 kHz. The sound field modelling calculated propagation losses up to 100 km from the source, with a horizontal separation of 20 m between receiver points along the modelled radials. A horizontal angular resolution of $\Delta\theta = 2.5^\circ$ for a total of $N = 144$ radial planes were

used. Receiver depths were chosen to span the entire water column over the modelled areas, from 2 m to a maximum of 5000 m, with step sizes that increased with depth.

For all stationary vessels, the SPL modelling results were converted to SEL by the duration of the measurement, which is appropriate for a non-impulsive noise source. As SEL was assessed over 8 or 24 h for a stationary vessel over a day (see Table 10), the conversion from SPL was obtained by increasing the levels by $10 \cdot \log_{10}(T)$, where T is either 28,800 or 86,400 (the number of seconds in 8 or 24 h, respectively).

For scenarios where a vessel was transiting along a track, a similar adjustment to the SPL was applied; however, the time factor was determined based on the step size along the track and the vessel's speed. See Appendix D.5 for details.

3.4.3. Vertical Seismic Profiling (VSP) and Sub-bottom Profiling

The above models were used in combination to characterise the acoustic fields at short and long ranges and in terms of SEL, SPL, PK, and PK-PK. Appendix D.1 details each model. MONM-BELLHOP was used to calculate SEL of a 360° area around each source location. FWRAM was used to model synthetic seismic and boomer pulses and to generate generalised range-dependent SEL to SPL conversion functions for the considered modelled sites. The range-dependent conversion functions were applied to predicted per-pulse SEL results from MONM-BELLHOP to estimate SPL values. FWRAM was also used to calculate water column PK and PK-PK levels.

VSTACK was used to calculate conversion functions applied to each modelled source, to better account for the increased bottom loss caused by the high shear wave speed in the calcareous seabed of this area, see Appendix D.1.5 for detail. Additionally, VSTACK was used to calculate the near field PK, PK-PK levels along 4 transects at the seafloor along the endfire and broadside directions for the VSP source. The boomer SBP PK sound level is too low to reach any relevant thresholds, and no near-field PK or PK-PK VSTACK calculations were performed for this scenario.

3.4.3.1. Per-pulse Modelling

To assess sound levels with MONM-BELLHOP, the sound field modelling calculated propagation losses up to distances at least 100 km from the source, with a horizontal separation of 20 m between receiver points along the modelled radials. The sound fields were modelled with a horizontal angular resolution of $\Delta\theta = 2.5^\circ$ for a total of $N = 144$ radial planes. Receiver depths were chosen to span the entire water column over the modelled areas, from 2 m to a maximum of 4000 m, with step sizes that increased with depth. To supplement the MONM results, high-frequency results for propagation loss were modelled using Bellhop for frequencies from 1.26 to 25 kHz. The MONM and Bellhop results were combined to produce results for the full frequency range of interest.

FWRAM was run to 100 km along only two radials (one endfire, one broadside) for computational efficiency from 5 to 1024 Hz in 1 Hz steps. In the context of VSP source geometry (see Appendix B.2), the radials were modelled perpendicular to the sagittal plane of the array and parallel to the sagittal plane of the array. This was done to compute SEL-to-SPL conversions (see Appendix D.4) but also to quantify water column PK and PK-PK. The horizontal range step was dependent on frequency and ranged from 50 m at lower frequencies to 10 m above 800 Hz.

For the VSP modelling, the maximum modelled range for VSTACK was 1000 m and a variable receiver range increment that increased away from the source, from 10 to 25 m, was used. Received levels were computed for a receiver 0.5 m above the seafloor.

3.4.3.2. Multiple-pulse Modelling

The VSP operation was assessed in this report by considering several potential scenarios for a maximum number of pulses per 24 h. The SEL was assessed over 24 h by adjusting the per-pulse SEL by $10 \cdot \log_{10}(N)$ (see Equation A-3), where the total number of pulses N was 10, 50, 100, or 130 per 24 h dependent on scenario at the two MODU locations (see Table 11).

The modelled accumulated SEL scenario for the SBP considered a set of nominal tracks where the acoustic source would be towed behind a vessel. The SBP acoustic source was modelled at multiple points along this track. When there are many pulses, it becomes computationally prohibitive to perform sound propagation modelling for every single event. If the distance between the consecutive pulses is small enough, the environmental parameters that influence sound propagation are virtually the same for many points. The acoustic fields can therefore, be modelled for a subset of pulses and estimated at several adjacent ones. The method to predict accumulated sound fields considered individual sound fields from representative modelled sites, which were then translated to account for the source position for nearby impulses. The sound field grids from all impulses were summed (Equation A-5) to produce the cumulative sound field grid with cell sizes of 20 m. The contours and threshold ranges were calculated from these flat Cartesian projections of the modelled acoustic fields.

The accumulated sound field computed with this approach is not as precise as modelling sound propagation at every impulse location, small-scale, site-specific sound propagation features tend to blur and become less relevant when sound fields from adjacent impulses are summed. Larger scale sound propagation features, primarily dependent on water depth, dominate the cumulative field.

4. Results

The maximum-over-depth sound fields for the modelled scenarios (described in Section 1.1) are presented below in two formats: as tables of distances to sound levels and, where the distances are long enough, as contour maps showing the directivity and range to various sound levels.

4.1. Vessel Operation Scenarios

4.1.1. Tabulated Results

Table 20 presents the maximum and 95% distances (defined in Appendix D.3) to SPL isopleths and thresholds at all drilling locations in T/49P and Tables 21 and Table 22 present the maximum and 95% distances to SPL isopleths and thresholds at all drilling locations in VIC/P79 for typical on-shelf locations and the deeper Garfield West location, respectively.

For the results below, the distances to isopleths/thresholds were reported from the most dominant single source, except for the distance to marine mammal behavioural response in Scenario 5. For this scenario, where the contour of the threshold is characterised by two lobes, the centroid location between the MODU and the centre of the standby box was used. Maps are provided in Section 4.1.2 to assist with contextualising tabulated distances.

Table 20. T/49P: *Vessel and drilling scenarios*: Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to sound pressure level (SPL) isopleths and thresholds at all drilling locations. Scenario descriptions are given in Table 10.

SPL (L_p ; dB re 1 μ Pa)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU		Scenario 4: MODU+Supply vessel		Scenario 5: MODU+Standby vessel		Scenario 6: MODU+Supply+ Standby vessels	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
British Admiral												
170 ^a	–	–	0.02	0.02	–	–	0.08	0.08	–	–	0.03	0.03
160	–	–	0.08	0.08	0.02	0.02	0.13	0.12	–	–	0.08	0.08
158 ^b	–	–	0.13	0.12	0.02	0.02	0.18	0.16	–	–	0.14	0.12
150	–	–	0.39	0.37	0.03	0.03	0.43	0.40	0.03	0.03	0.39	0.38
140	0.03	0.03	1.02	0.98	0.09	0.09	1.04	0.93	0.10	0.09	1.03	0.98
130	0.16	0.16	3.15	2.86	0.43	0.40	3.13	2.87	0.42	0.40	3.13	2.88
120 ^c	0.50	0.47	11.3	10.3	1.41	1.30	11.4	10.4	2.32	2.09	11.4	10.4
110	1.30	1.16	37.0	32.8	5.16	4.69	37.6	33.3	5.25	4.85	37.6	33.3
Flanagan												
170 ^a	–	–	0.02	0.02	–	–	0.08	0.08	–	–	0.04	0.03
160	–	–	0.08	0.08	–	–	0.12	0.12	–	–	0.08	0.08
158 ^b	–	–	0.13	0.13	0.02	0.02	0.19	0.17	–	–	0.13	0.13
150	–	–	0.38	0.36	0.03	0.03	0.42	0.39	0.03	0.03	0.39	0.36
140	0.03	0.03	0.99	0.90	0.13	0.12	1.02	0.93	0.13	0.12	1.01	0.96
130	0.18	0.17	3.21	3.02	0.42	0.40	3.24	3.04	0.41	0.40	3.24	3.04
120 ^c	0.44	0.42	11.8	10.6	1.34	1.24	12.0	10.9	2.03	10.7	12.0	10.9
110	1.21	1.17	39.4	35.4	5.09	4.77	39.9	36.1	5.13	4.83	39.9	36.1
British Admiral West												
170 ^a	n/a	n/a	n/a	n/a	–	–	0.08	0.08	n/a	n/a	n/a	n/a
160	n/a	n/a	n/a	n/a	–	–	0.13	0.12	n/a	n/a	n/a	n/a
158 ^b	n/a	n/a	n/a	n/a	–	–	0.15	0.14	n/a	n/a	n/a	n/a
150	n/a	n/a	n/a	n/a	0.03	0.03	0.41	0.38	n/a	n/a	n/a	n/a
140	n/a	n/a	n/a	n/a	0.09	0.09	1.04	0.94	n/a	n/a	n/a	n/a
130	n/a	n/a	n/a	n/a	0.44	0.41	3.17	2.92	n/a	n/a	n/a	n/a
120 ^c	n/a	n/a	n/a	n/a	1.48	1.25	11.8	10.5	n/a	n/a	n/a	n/a
110	n/a	n/a	n/a	n/a	4.95	4.58	39.6	35.8	n/a	n/a	n/a	n/a

^a 48 h threshold for recoverable injury for fish with a swim bladder involved in hearing (Popper et al. 2014).

^b 12 h threshold for TTS for fish with a swim bladder involved in hearing (Popper et al. 2014).

^c Threshold for marine mammal behavioural response to non-impulsive noise (NOAA 2019).

A dash indicates the threshold is not reached within the limits of the modelled resolution (20 m).

Table 21. VIC/79P: Vessel and drilling scenarios: Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to sound pressure level (SPL) isopleths and thresholds at all locations. Scenario descriptions are given in Table 10.

SPL (L_p ; dB re 1 μ Pa)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 5: MODU+Standby vessel		Scenario 6: MODU+Supply +Standby vessels	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
Merope								
180	–	–	–	–	–	–	0.02	0.02
170 ^a	–	–	0.02	0.02	–	–	0.02	0.02
160	–	–	0.10	0.10	–	–	0.10	0.10
158 ^b	–	–	0.13	0.13	–	–	0.13	0.13
150	–	–	0.34	0.33	0.03	0.03	0.35	0.33
140	0.03	0.03	0.99	0.88	0.12	0.12	0.99	0.89
130	0.15	0.14	3.66	3.16	0.42	0.40	4.26	3.58
120 ^c	0.44	0.39	12.0	10.6	2.25	2.03	12.6	10.8
110	1.18	1.10	41.1	33.6	5.79	5.26	41.9	34.0
Julpha								
180	–	–	–	–	–	–	0.02	0.02
170 ^a	–	–	0.02	0.02	–	–	0.02	0.02
160	–	–	0.09	0.09	–	–	0.09	0.09
158 ^b	–	–	0.13	0.13	–	–	0.13	0.13
150	–	–	0.35	0.34	0.02	0.02	0.35	0.34
140	0.03	0.03	1.09	0.90	0.13	0.13	1.09	0.91
130	0.13	0.13	3.62	3.25	0.47	0.45	4.28	3.63
120 ^c	0.42	0.40	12.2	10.9	2.39	2.12	12.3	11.1
110	1.11	1.07	39.9	34.7	6.70	6.05	40.8	34.8
Essington								
180	–	–	–	–	–	–	0.02	0.02
170 ^a	–	–	0.02	0.02	–	–	0.03	0.03
160	–	–	0.07	0.07	–	–	0.08	0.08
158 ^b	–	–	0.13	0.13	–	–	0.14	0.13
150	–	–	0.38	0.36	0.03	0.03	0.38	0.37
140	0.03	0.03	1.00	0.90	0.12	0.12	1.00	0.91
130	0.18	0.17	3.18	2.93	0.42	0.40	3.70	3.34
120 ^c	0.47	0.44	11.6	10.5	2.44	2.11	12.2	10.9
110	1.21	1.16	37.1	32.3	5.50	5.04	38.0	32.9
Garfield								
180	–	–	–	–	–	–	0.02	0.02
170 ^a	–	–	0.02	0.02	–	–	0.03	0.03
160	–	–	0.07	0.07	–	–	0.08	0.08
158 ^b	–	–	0.09	0.09	–	–	0.10	0.09
150	–	–	0.31	0.29	0.03	0.03	0.31	0.30
140	0.03	0.03	0.91	0.83	0.09	0.09	0.91	0.84
130	0.18	0.17	3.06	2.72	0.42	0.40	3.57	3.06
120 ^c	0.44	0.41	11.6	10.1	2.32	2.00	12.2	10.2
110	1.20	1.12	39.4	32.7	5.26	4.62	40.9	33.1

^a 48 h threshold for recoverable injury for fish with a swim bladder involved in hearing (Popper et al. 2014).

^b 12 h threshold for TTS for fish with a swim bladder involved in hearing (Popper et al. 2014).

^c Threshold for marine mammal behavioural response to non-impulsive noise (NOAA 2019).

A dash indicates the threshold is not reached within the limits of the modelled resolution (20 m).

Table 22. VIC/P79: *Garfield West vessel and drilling scenarios*: Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to sound pressure level (SPL) isopleths and thresholds at both drilling locations. Scenario descriptions are given in Table 10.

SPL (L_p ; dB re 1 μ Pa)	Demo Scenario 3: Drilling		Demo Scenario 4: Drilling with resupply	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
180	–	–	0.02	0.02
170 ^a	–	–	0.06	0.06
160	–	–	0.06	0.06
158 ^b	–	–	0.08	0.08
150	0.02	0.02	0.20	0.20
140	0.07	0.07	1.17	0.99
130	0.25	0.24	7.84	5.43
120 ^c	1.39	1.16	22.8	18.9
110	8.78	6.64	141	98.7

^a 48 h threshold for recoverable injury for fish with a swim bladder involved in hearing (Popper et al. 2014).

^b 12 h threshold for TTS for fish with a swim bladder involved in hearing (Popper et al. 2014).

^c Threshold for marine mammal behavioural response to non-impulsive noise (NOAA 2019).

A dash indicates the threshold is not reached within the limits of the modelled resolution (20 m).

Tables 23 to 30 present the maximum distances to frequency weighted SEL_{24h} thresholds, as well as total ensonified area for all scenarios at all nominal locations in T/49P and VIC/P79.

Table 23. T/49P: *British Admiral—Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	<i>British Admiral</i>											
		Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU		Scenario 4: MODU+Supply vessel		Scenario 5: MODU+Standby vessel		Scenario 6: MODU+Supply+Standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS													
LF cetaceans	199	–	/	0.27	0.21	0.03	/	0.19	0.07	0.03	/	0.20	0.07
HF cetaceans	198	–	/	–	/	0.02	/	0.06	/	–	/	0.06	/
VHF cetaceans	173	–	/	0.11	0.04	0.19	0.10	0.21	0.12	0.19	0.1	0.21	0.12
Otariid seals	219	–	/	–	/	–	/	0.06	/	–	/	0.06	/
Sea turtles	220	–	/	–	/	–	/	0.06	/	–	/	0.06	/
TTS													
LF cetaceans	179	0.07	0.69	2.88	21.1	0.40	0.41	1.76	7.25	0.41	1.08	1.79	7.93
HF cetaceans	178	–	/	0.09	0.03	0.09	0.03	0.14	0.04	0.09	0.03	0.16	0.04
VHF cetaceans	153	–	/	1.43	6.39	1.53	7.29	1.73	8.52	1.54	7.41	1.79	8.71
Otariid seals	199	–	/	0.08	0.02	0.02	/	0.10	0.01	–	/	0.10	0.01
Sea turtles	200	–	/	0.22	0.15	0.02	/	0.20	0.07	–	/	0.20	0.07

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 24. T/49P: *Flanagan—Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	<i>Flanagan</i>											
		Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU		Scenario 4: MODU+Supply vessel		Scenario 5: MODU+Standby vessel		Scenario 6: MODU+Supply+Standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS													
LF cetaceans	199	–	/	0.29	0.25	0.03	/	0.20	0.07	0.03	/	0.20	0.07
HF cetaceans	198	–	/	–	/	0.02	/	0.06	/	–	/	0.06	/
VHF cetaceans	173	–	/	0.12	0.05	0.18	0.10	0.21	0.13	0.17	0.1	0.25	0.13
Otariid seals	219	–	/	–	/	–	/	0.06	/	–	/	0.06	/
Sea turtles	220	–	/	–	/	–	/	0.06	/	–	/	0.06	/
TTS													
LF cetaceans	179	0.07	0.69	3.11	22.2	0.38	0.45	1.68	7.38	0.40	1.12	1.68	8.02
HF cetaceans	178	–	/	0.09	0.03	0.10	0.03	0.14	0.05	0.09	0.03	0.16	0.05
VHF cetaceans	153	–	/	1.43	6.43	1.54	7.29	1.72	8.80	1.54	7.42	1.80	8.99
Otariid seals	199	–	/	0.08	0.02	0.02	/	0.10	0.01	–	/	0.10	0.01
Sea turtles	200	–	/	0.22	0.15	0.02	/	0.20	0.07	–	/	0.20	0.07

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).
 A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 25. T/49P: *British Admiral West*—*Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re 1 $\mu Pa^2 \cdot s$)	British Admiral West			
		Scenario 3: MODU		Scenario 4: MODU+Supply vessel	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS					
LF cetaceans	199	0.03	/	0.19	0.07
HF cetaceans	198	–	/	0.06	/
VHF cetaceans	173	0.18	0.10	0.21	0.12
Otariid seals	219	–	/	0.06	/
Sea turtles	220	–	/	0.06	/
TTS					
LF cetaceans	179	0.42	0.40	1.66	7.00
HF cetaceans	178	0.09	0.03	0.13	0.04
VHF cetaceans	153	1.54	7.26	1.74	8.42
Otariid seals	199	–	/	0.10	0.01
Sea turtles	200	–	/	0.20	0.07

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 26. VIC/P79 – Northern extent: *Merope Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re 1 $\mu Pa^2 \cdot s$)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU+Standby vessel		Scenario 6: MODU+Supply+S standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS									
LF cetaceans	199	–	/	0.30	0.26	0.02	/	0.18	0.08
HF cetaceans	198	–	/	–	/	–	/	0.04	/
VHF cetaceans	173	–	/	0.13	0.06	0.20	0.12	0.21	0.11
Otariid pinnipeds in water	219	–	/	–	/	–	/	0.02	/
Sea turtles	220	–	/	–	/	–	/	0.06	/
TTS									
LF cetaceans	179	2.53	0.69	3.42	28.8	0.41	1.09	1.93	7.98
HF cetaceans	178	–	/	0.11	0.04	0.12	0.04	0.15	0.06
VHF cetaceans	153	–	/	1.516	6.86	2.83	7.42	3.22	8.99
Otariid pinnipeds in water	199	–	/	0.07	0.02	–	/	0.07	0.01
Sea turtles	200	–	/	0.28	0.18	–	/	0.13	0.05

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 27. VIC/P79 – Northern extent: *Julpha Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU+Standby vessel		Scenario 6: MODU+Supply+S standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS									
LF cetaceans	199	–	/	0.30	0.26	0.02	/	0.20	0.10
HF cetaceans	198	–	/	–	/	–	/	0.04	/
VHF cetaceans	173	–	/	0.15	0.07	0.21	0.12	0.24	0.14
Otariid pinnipeds in water	219	–	/	–	/	–	/	0.02	/
Sea turtles	220	–	/	–	/	–	/	0.06	/
TTS									
LF cetaceans	179	2.70	0.69	3.59	29.8	0.46	1.23	1.64	11.1
HF cetaceans	178	–	/	0.12	0.04	0.12	0.04	0.15	0.06
VHF cetaceans	153	–	/	1.55	7.07	2.84	7.39	2.89	9.11
Otariid pinnipeds in water	199	–	/	0.08	0.02	–	/	0.07	0.01
Sea turtles	200	–	/	0.23	0.16	–	/	0.15	0.06

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).
 A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 28. VIC/P79 – Southern extent: *Essington Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU+Standby vessel		Scenario 6: MODU+Supply+ Standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS									
LF cetaceans	199	–	/	0.32	0.25	0.03	/	0.18	0.07
HF cetaceans	198	–	/	–	/	–	/	0.04	/
VHF cetaceans	173	–	/	0.12	0.04	0.18	0.10	0.21	0.12
Otariid pinnipeds in water	219	–	/	–	/	–	/	0.02	/
Sea turtles	220	–	/	–	/	–	/	0.06	/
TTS									
LF cetaceans	179	2.73	0.69	3.11	22.2	0.41	1.13	1.62	7.81
HF cetaceans	178	–	/	0.09	0.03	0.09	0.03	0.14	0.05
VHF cetaceans	153	–	/	1.44	6.42	2.98	7.42	2.96	8.95
Otariid pinnipeds in water	199	–	/	0.08	0.02	–	/	0.07	0.01
Sea turtles	200	–	/	0.22	0.16	–	/	0.14	0.07

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).
 A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 29. VIC/P79 – Southern extent: *Garfield Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU+Standby vessel		Scenario 6: MODU+Supply+ Standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS									
LF cetaceans	199	–	/	0.27	0.21	0.03	/	0.15	0.05
HF cetaceans	198	–	/	–	/	–	/	0.04	/
VHF cetaceans	173	–	/	0.11	0.04	0.19	0.09	0.21	0.11
Otariid pinnipeds in water	219	–	/	–	/	–	/	0.02	/
Sea turtles	220	–	/	–	/	–	/	0.06	/
TTS									
LF cetaceans	179	2.49	0.69	2.82	18.9	0.39	1.03	1.62	6.98
HF cetaceans	178	–	/	0.09	0.03	0.09	0.03	0.13	0.04
VHF cetaceans	153	–	/	1.40	6.14	2.88	7.37	2.92	8.40
Otariid pinnipeds in water	199	–	/	0.08	0.02	–	/	0.07	0.01
Sea turtles	200	–	/	0.23	0.16	–	/	0.12	0.03

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).
 A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 30. VIC/P79 – Southern extent: *Garfield West Vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 10.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	Scenario 3: MODU		Scenario 4: MODU+Supply	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS					
LF cetaceans	199	–	/	0.15	0.03
HF cetaceans	198	–	/	0.06	/
VHF cetaceans	173	0.13	0.06	0.16	0.07
Otariid pinnipeds in water	219	–	/	0.06	/
Sea turtles	220	–	/	0.06	/
TTS					
LF cetaceans	179	0.23	0.16	2.30	11.5
HF cetaceans	178	0.09	0.02	0.12	0.03
VHF cetaceans	153	1.51	7.10	1.66	7.95
Otariid pinnipeds in water	199	–	/	0.08	/
Sea turtles	200	–	/	0.13	0.02

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).
 A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

4.1.2. Sound Field Maps

Maps of the estimated sound fields, threshold contours and isopleths of interest for SPL and SEL_{24h} sound fields are presented in the following sections, sorted by each nominal location and then by scenario.

4.1.2.1. Instantaneous SPL Sound level Contour Maps

4.1.2.1.1. T/49P British Admiral

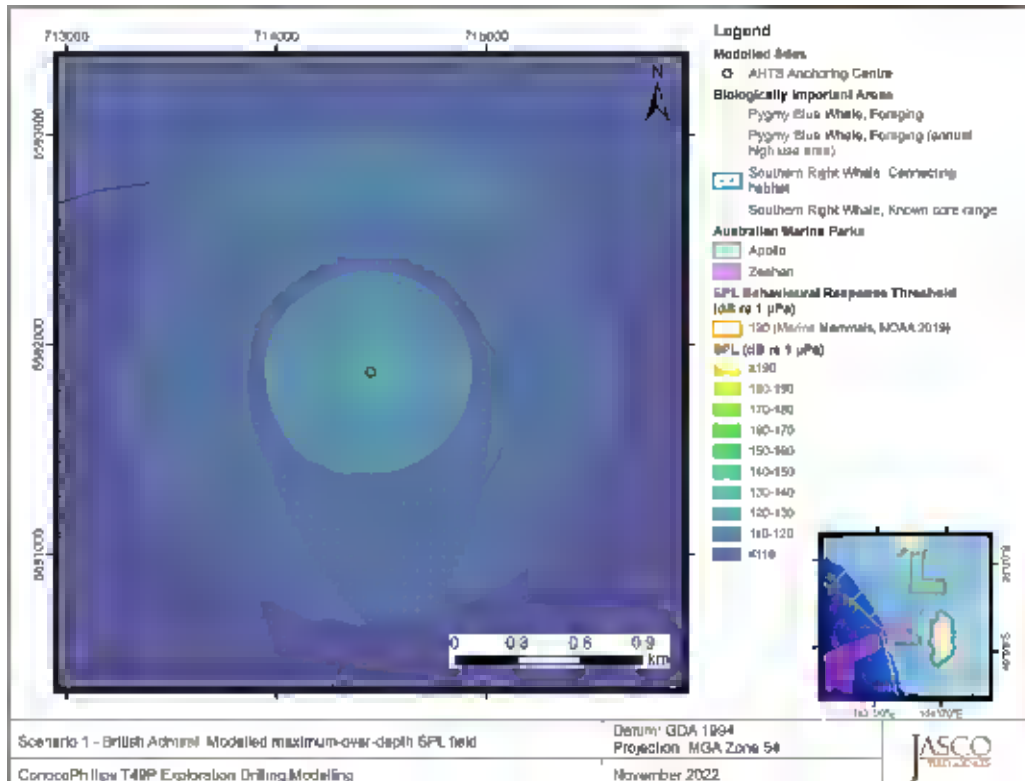


Figure 18. Scenario 1— T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

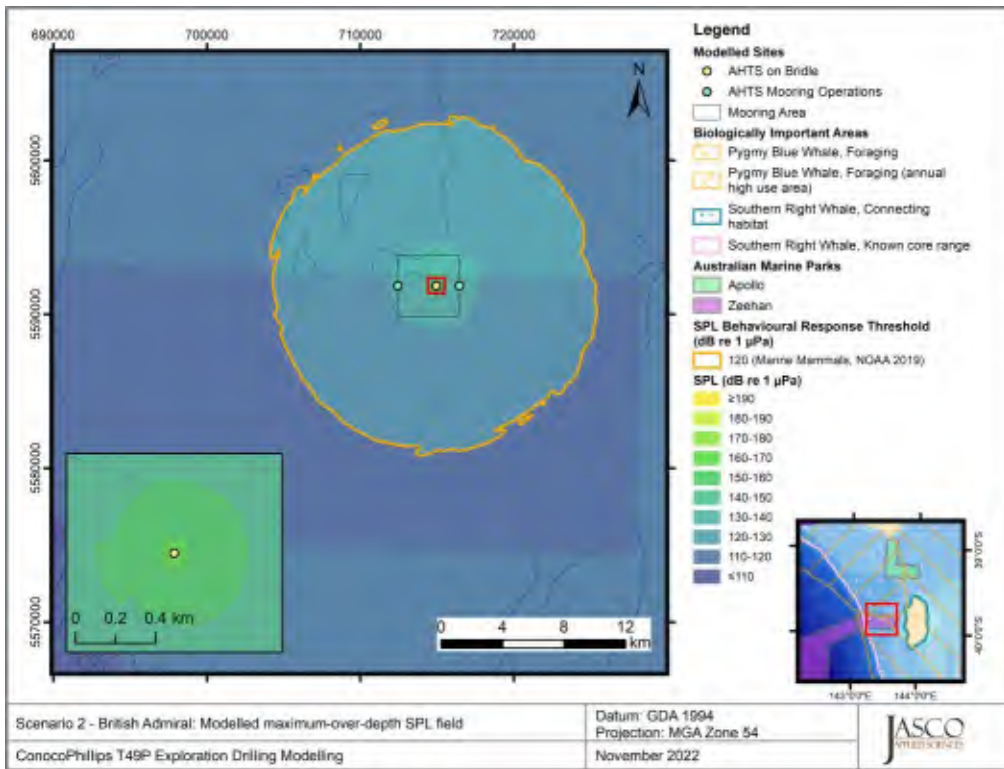


Figure 19. Scenario 2— T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

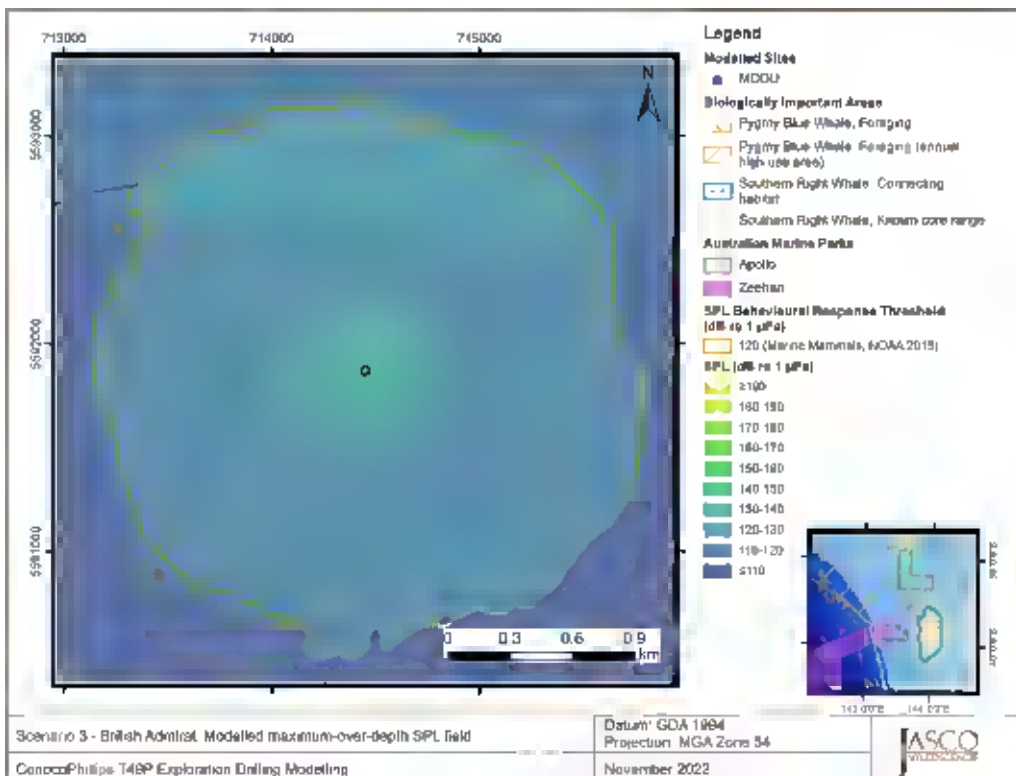


Figure 20. Scenario 3— T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

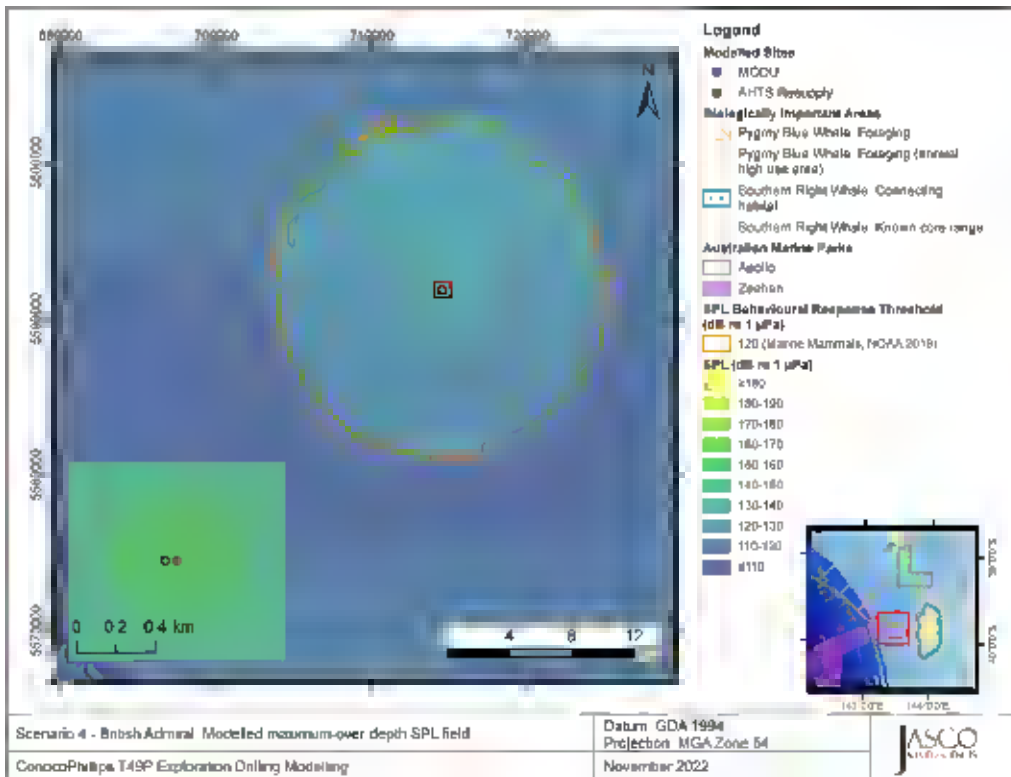


Figure 21. Scenario 4— T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

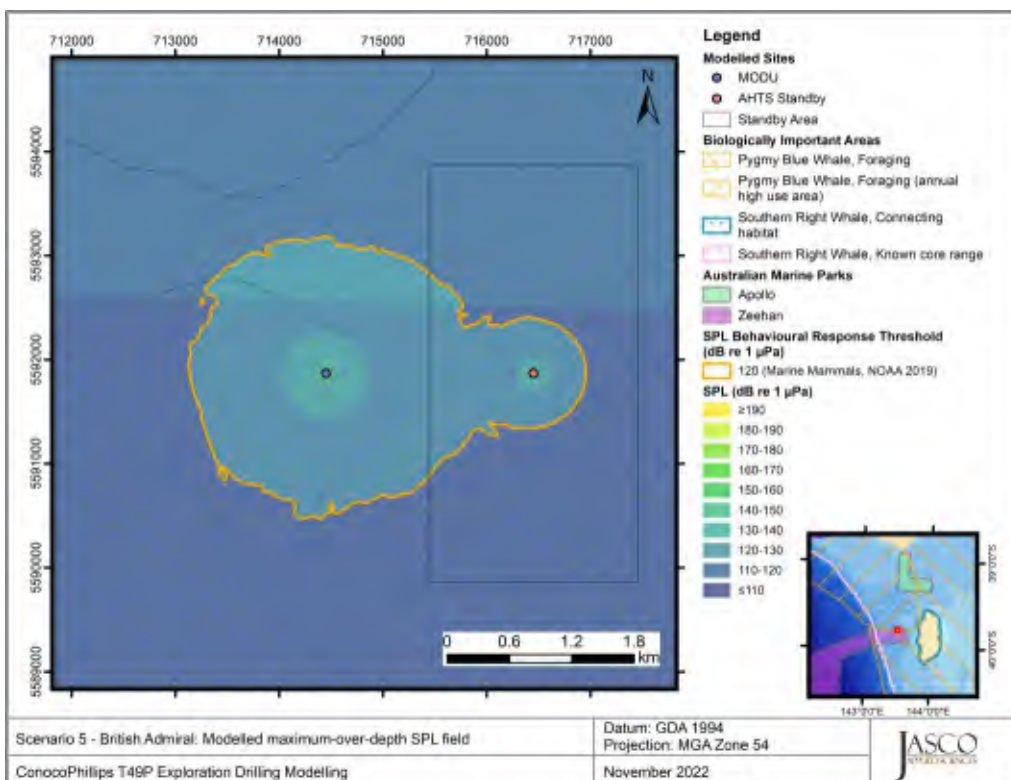


Figure 22. Scenario 5— T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

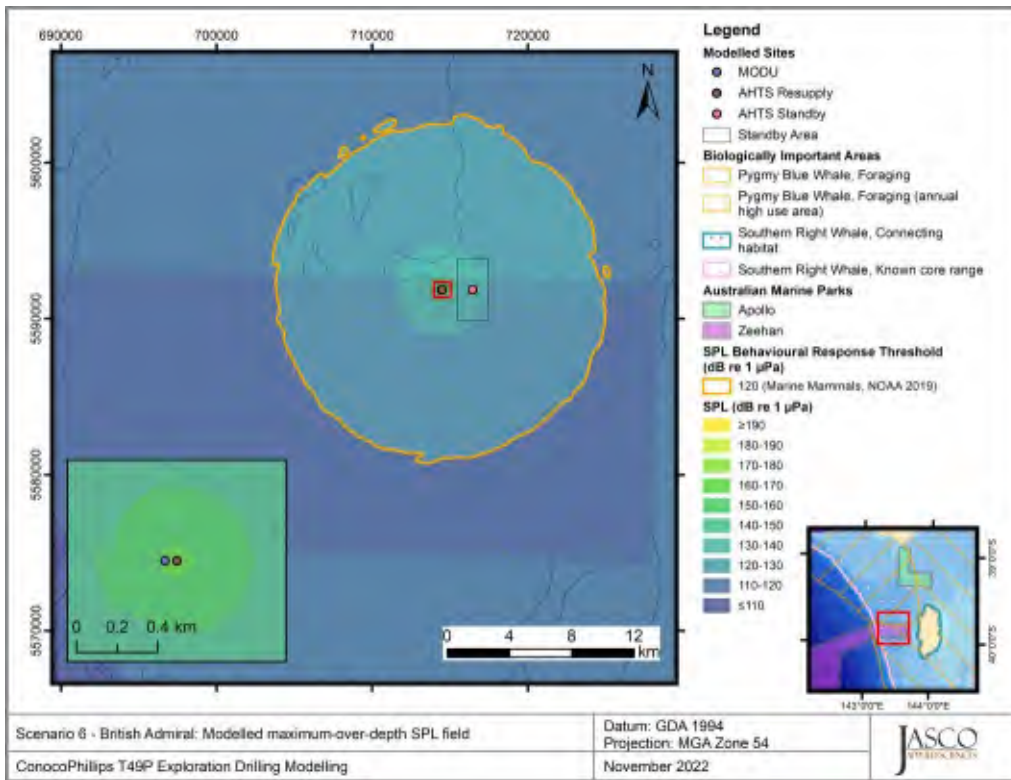


Figure 23. Scenario 6— T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.2. T/49P Flanagan

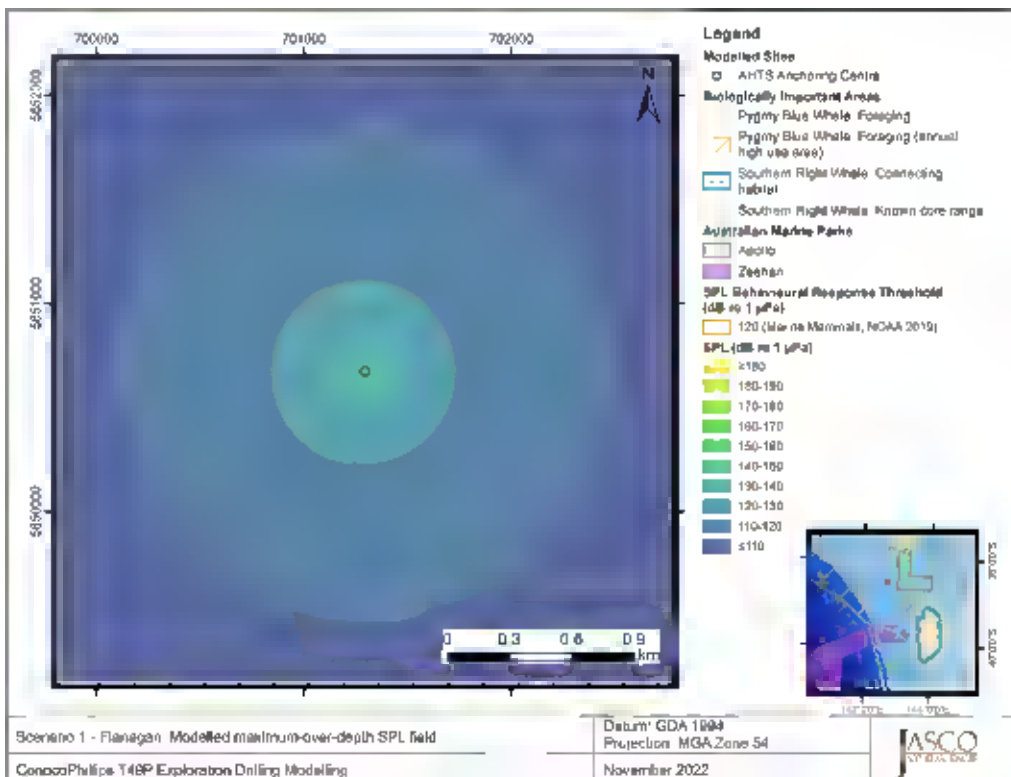


Figure 24. Scenario 1— T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

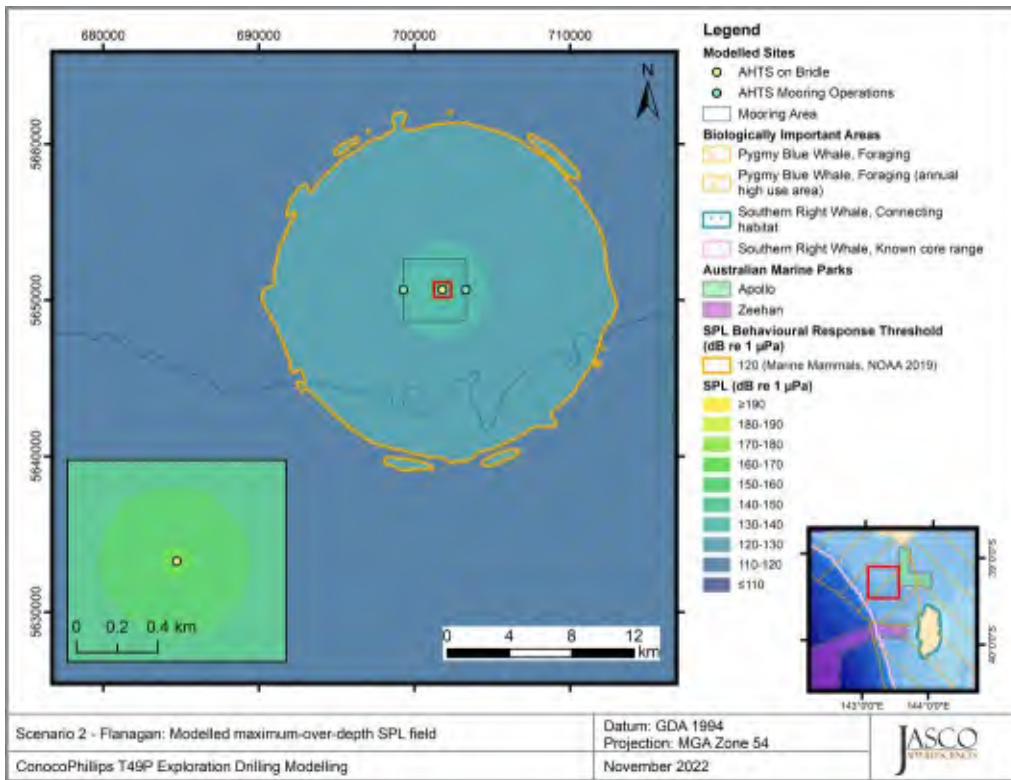


Figure 25. Scenario 2— T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

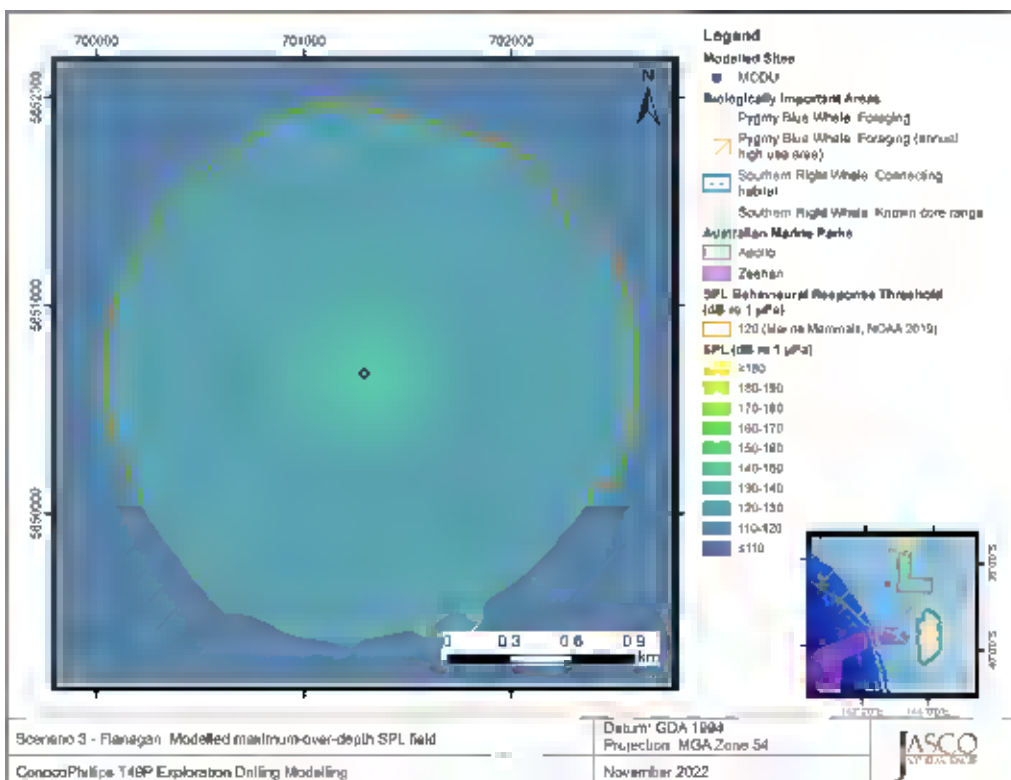


Figure 26. Scenario 3— T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

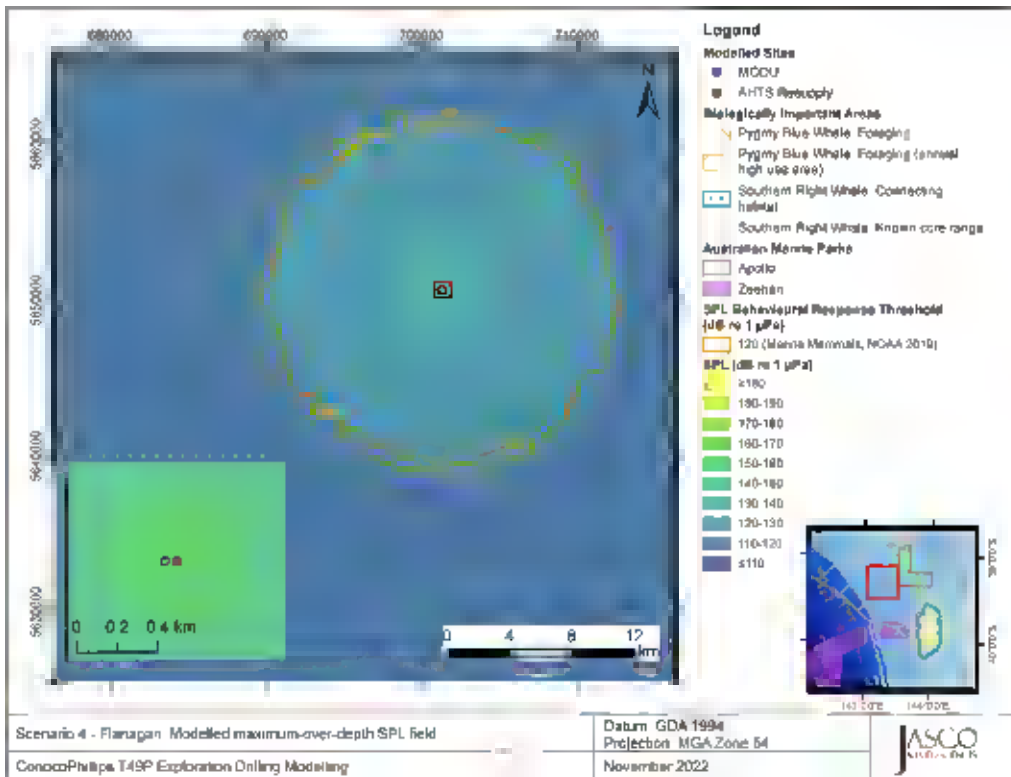


Figure 27. Scenario 4— T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

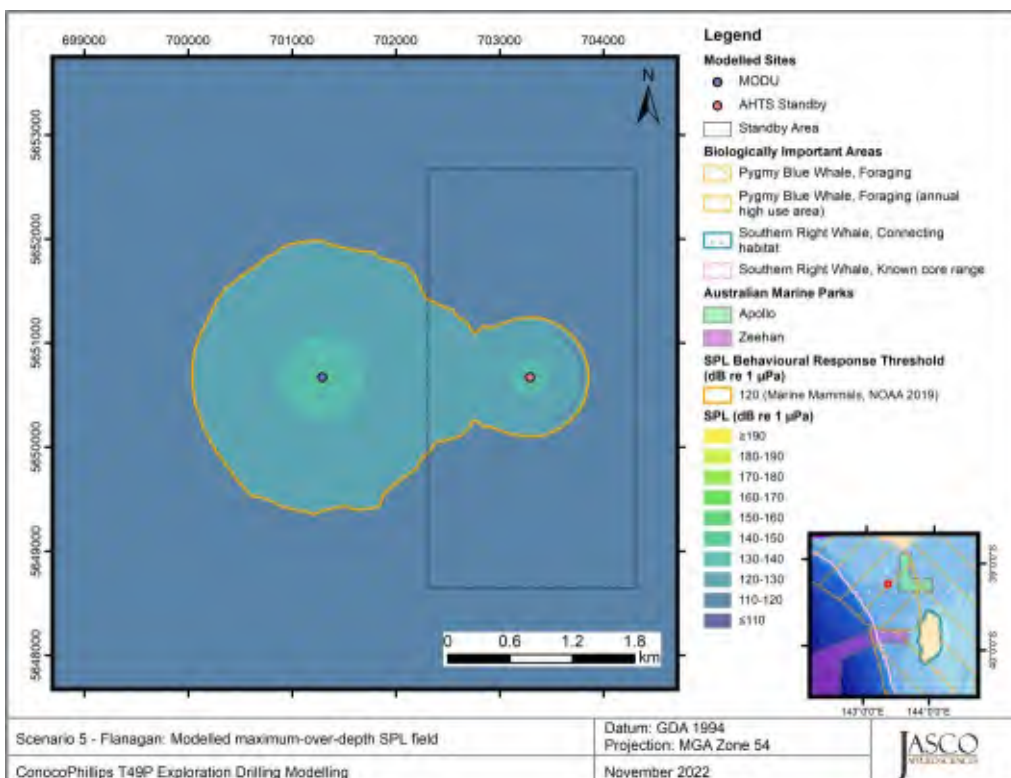


Figure 28. Scenario 5— T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

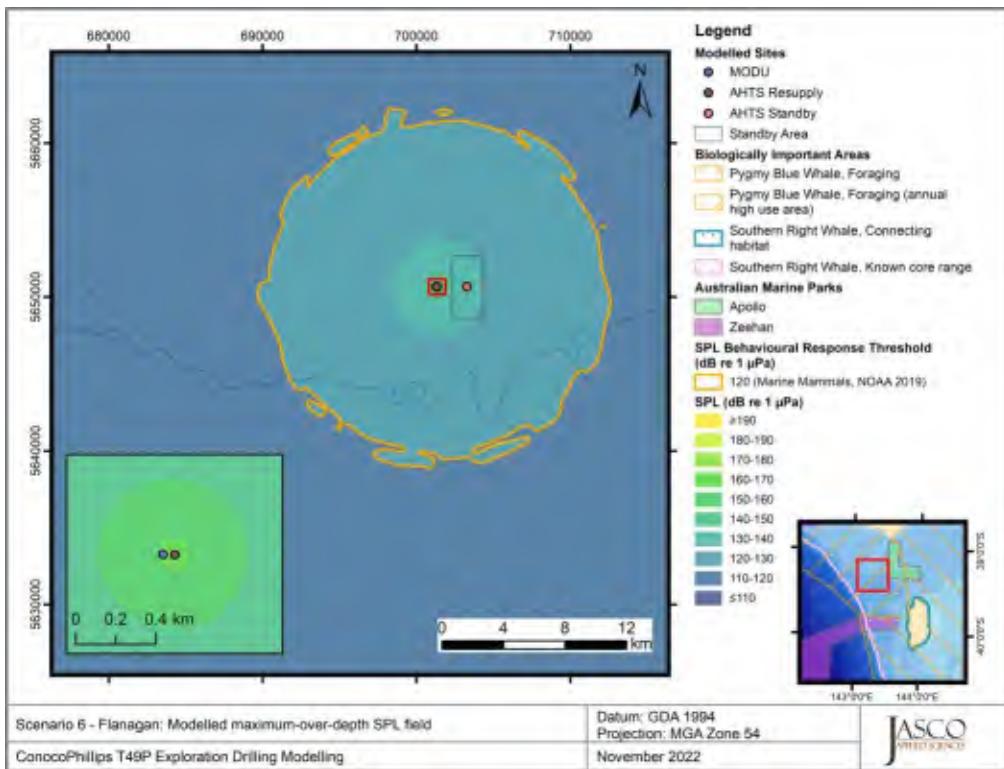


Figure 29. Scenario 6— T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.3. T/49P British Admiral West

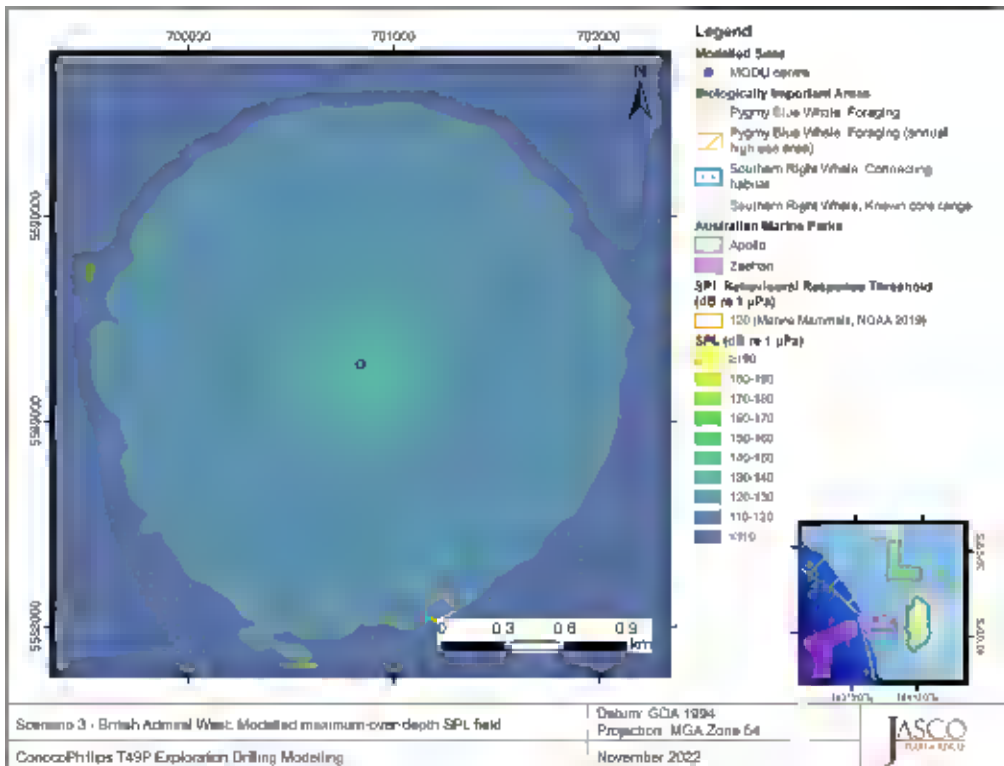


Figure 30. Scenario 3— T/49P British Admiral West, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

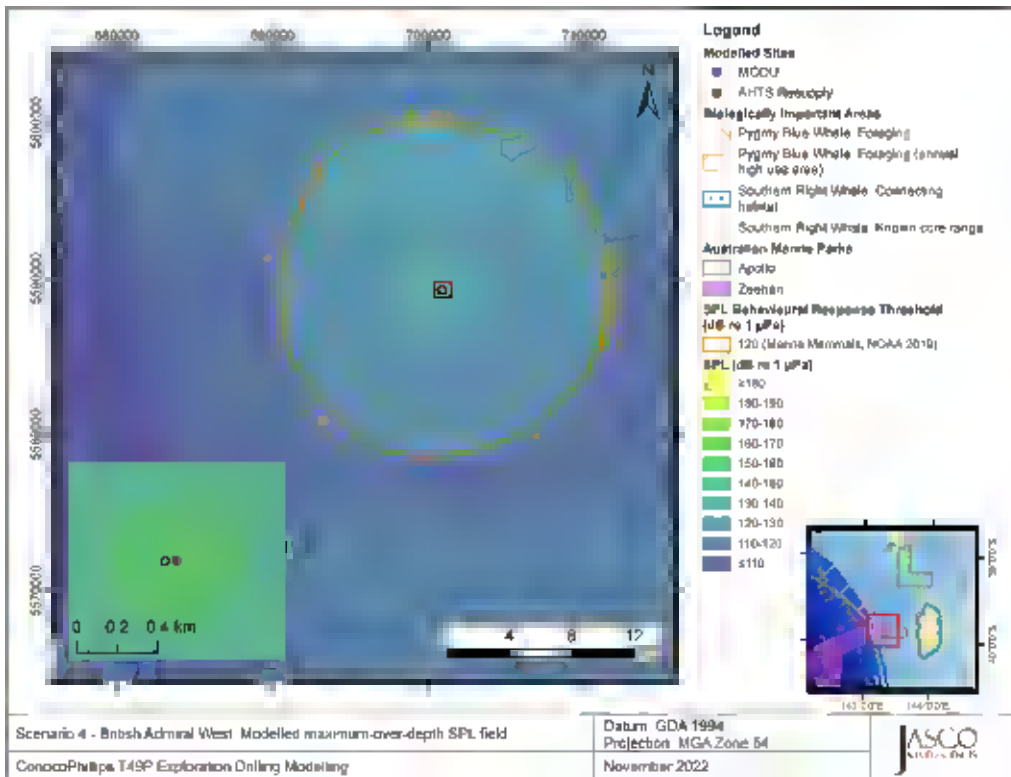


Figure 31. Scenario 4— T/49P British Admiral West, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.4. VIC/P79 Merope

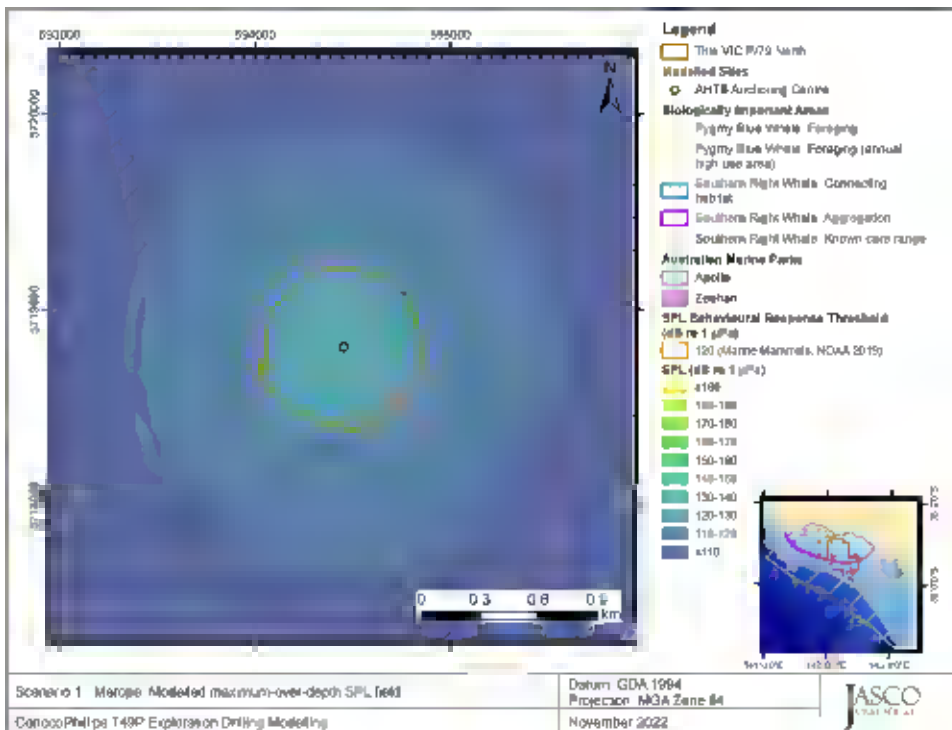


Figure 32. Scenario 1, Prelay — VIC/P79 Merope, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

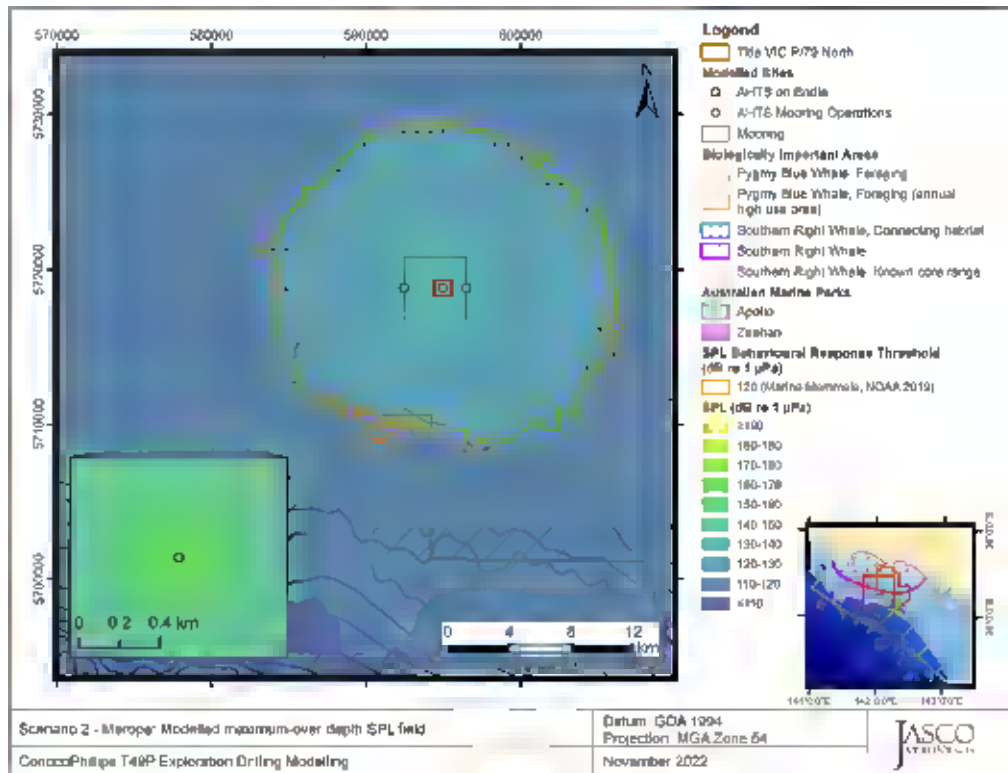


Figure 33. Scenario 2, Mooring — VIC/P79 Merope, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

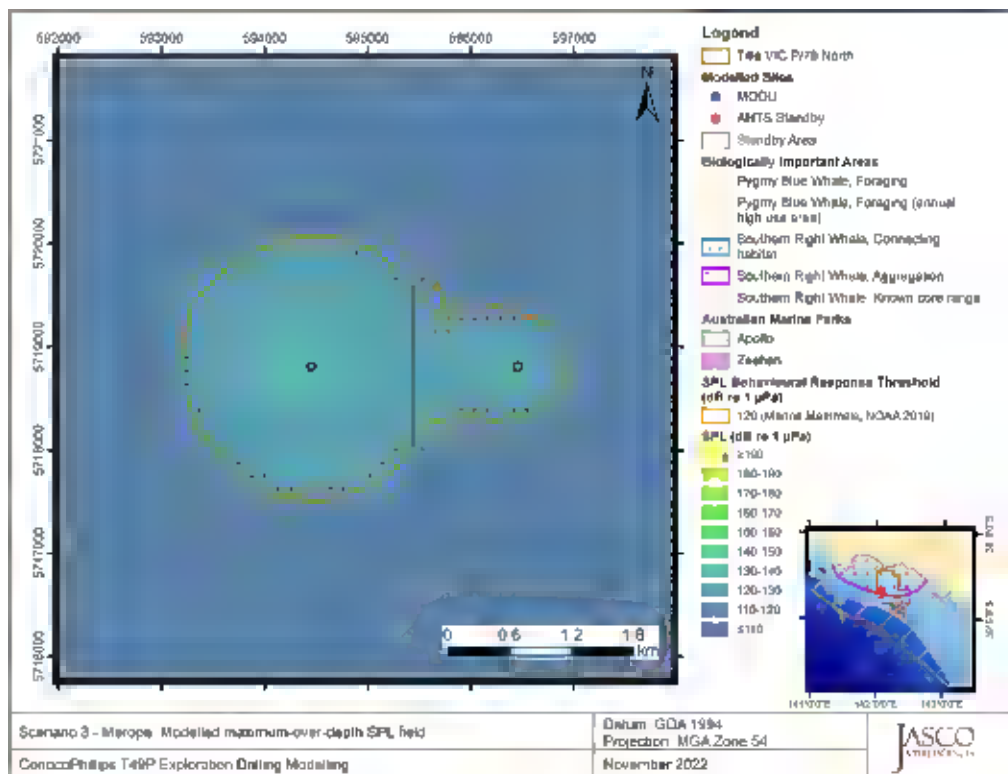


Figure 34. Scenario 5, Drilling with standby vessel — VIC/P79 Merope, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

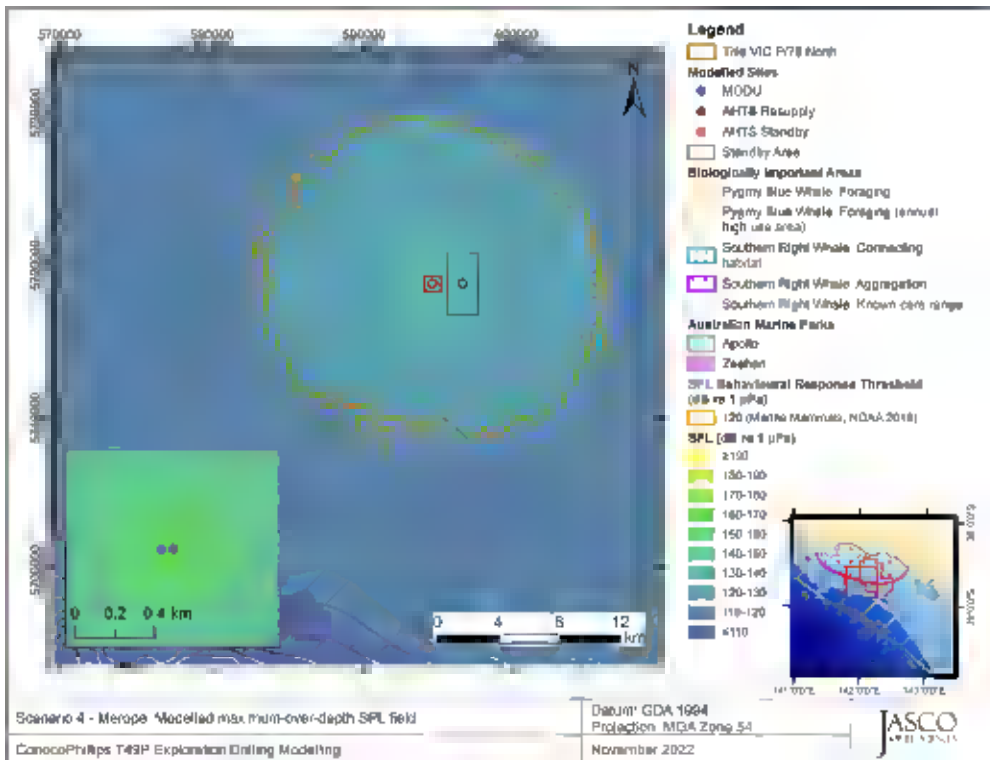


Figure 35. Scenario 4, Drilling, resupply and standby vessel — VIC/P78 Merope, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.5. VIC/P79 Julpha

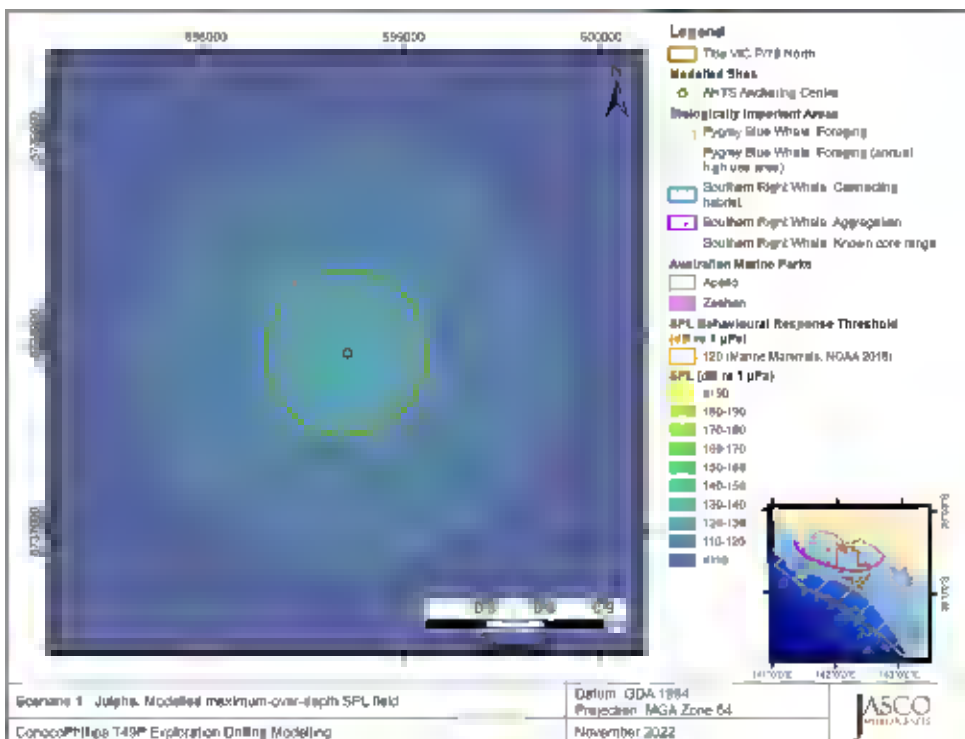


Figure 36. Scenario 1, Prelay — VIC/P79 Julpha, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

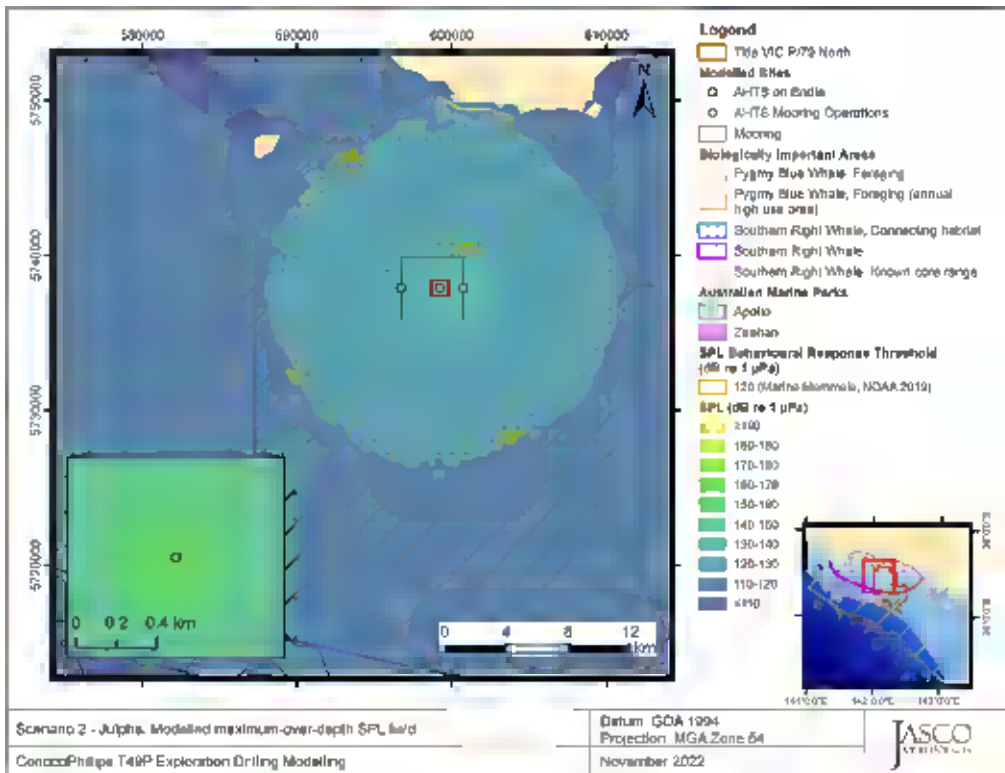


Figure 37. Scenario 2, Mooring — VIC/P79 Julpha, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

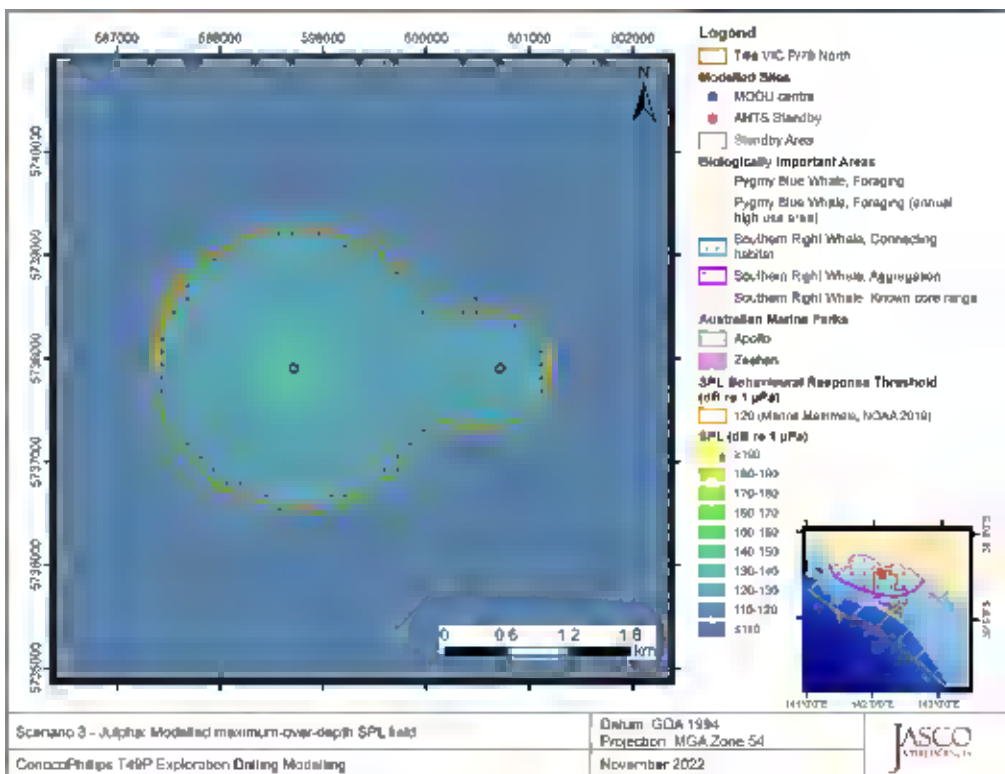


Figure 38. Scenario 5, Drilling with standby vessel — VIC/P79 Julpha, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

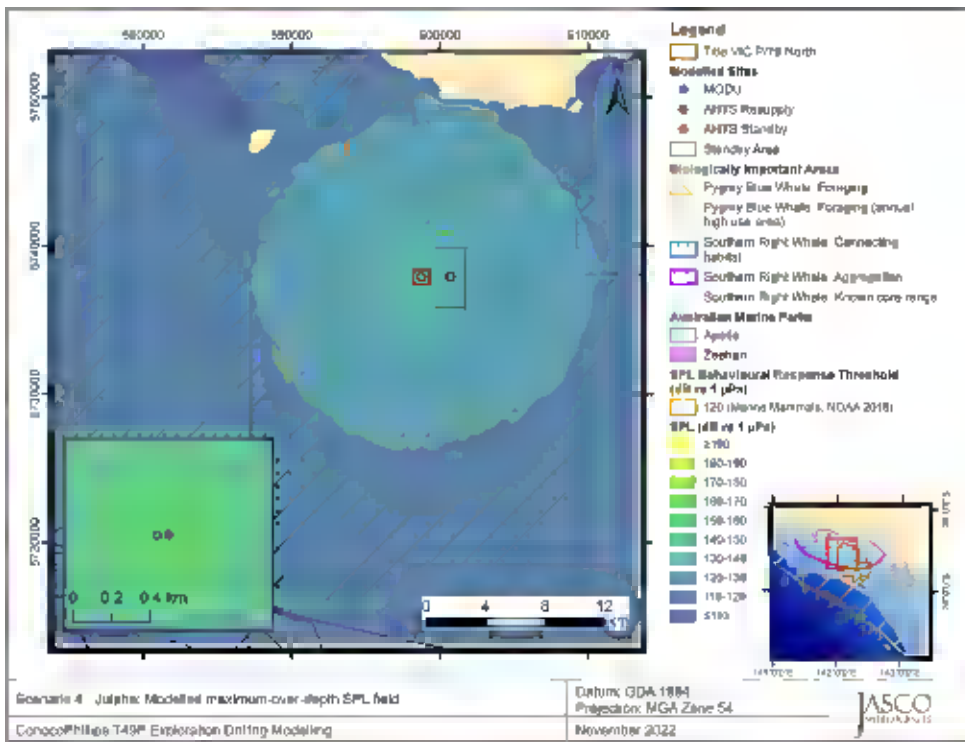


Figure 39. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Julpha, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.6. VIC/P79 Essington

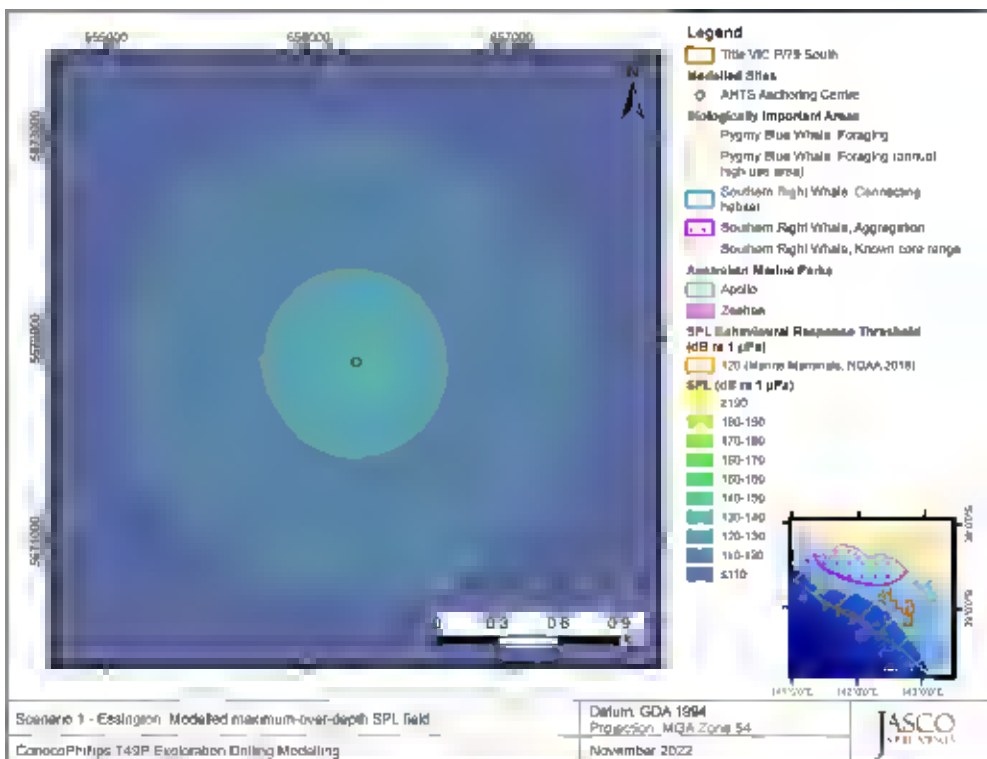


Figure 40. Scenario 1, Pre-Drilling — VIC/P79 Essington, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

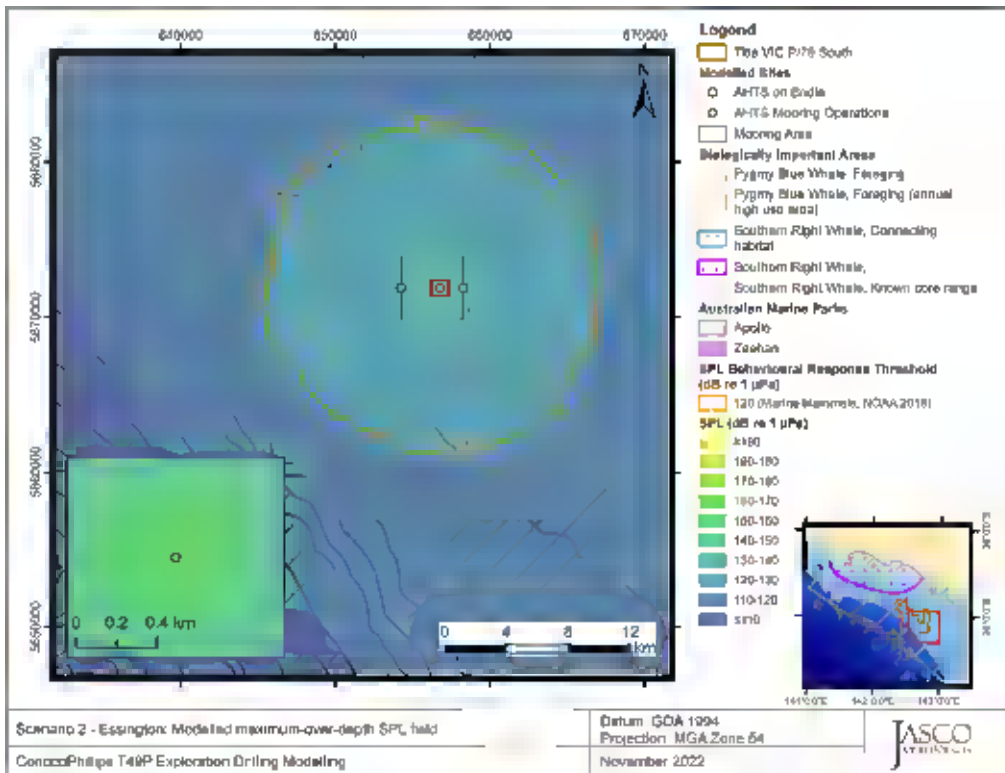


Figure 41. Scenario 2, Mooring — VIC/P79 Essington, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

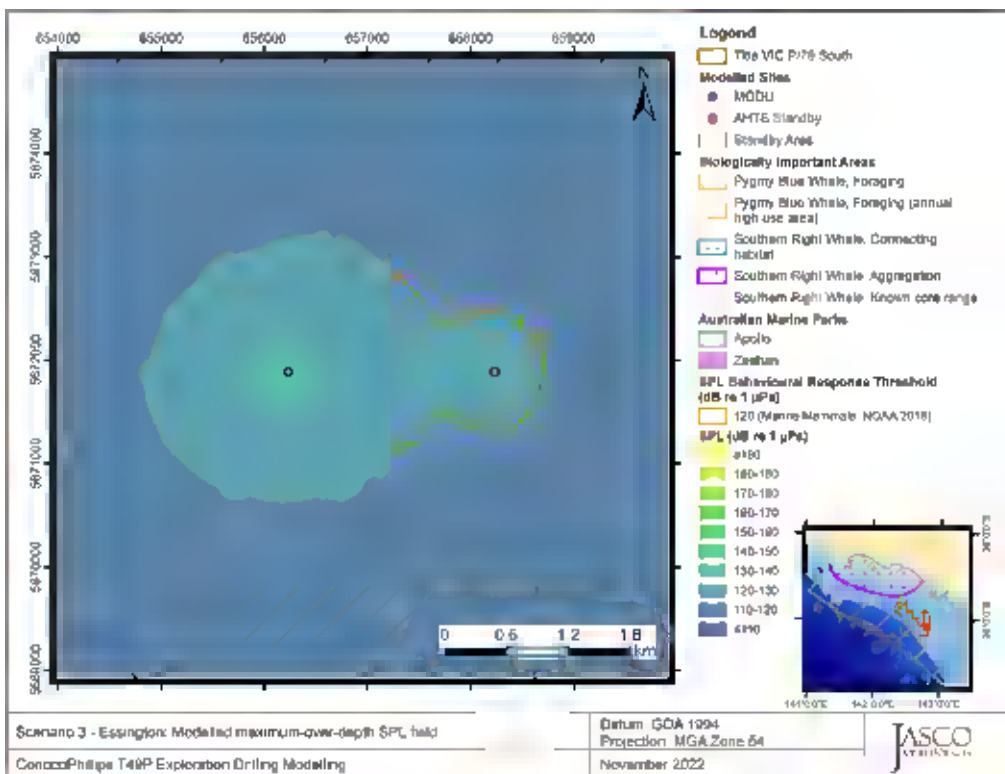


Figure 42. Scenario 5, Drilling with standby vessel — VIC/P79 Essington, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

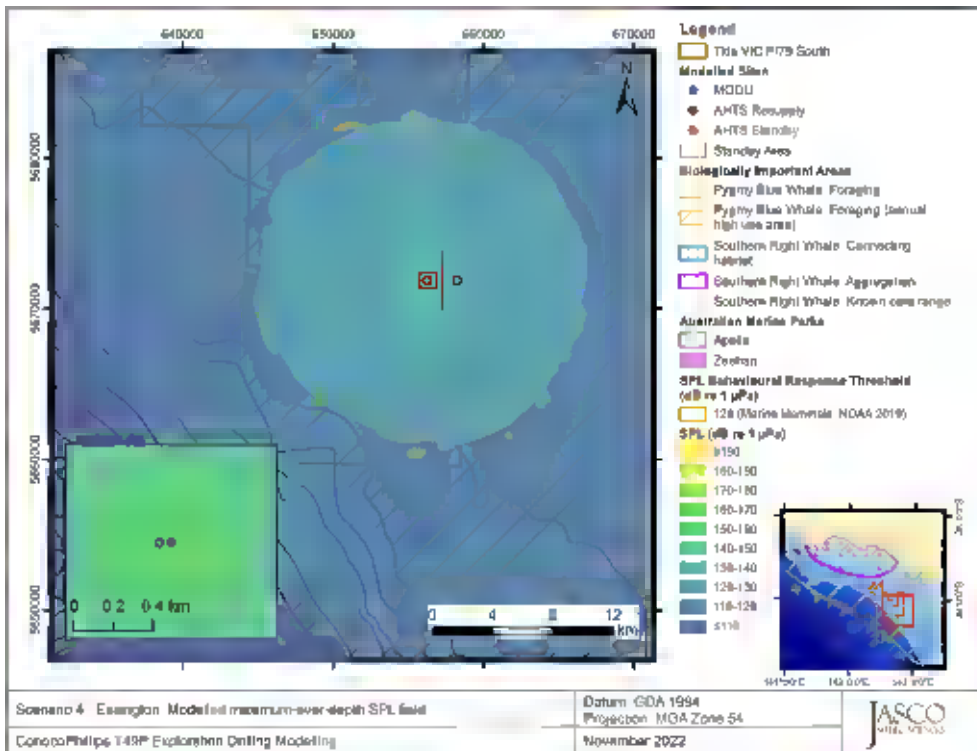


Figure 43. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Essington, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.7. VIC/P79 Garfield

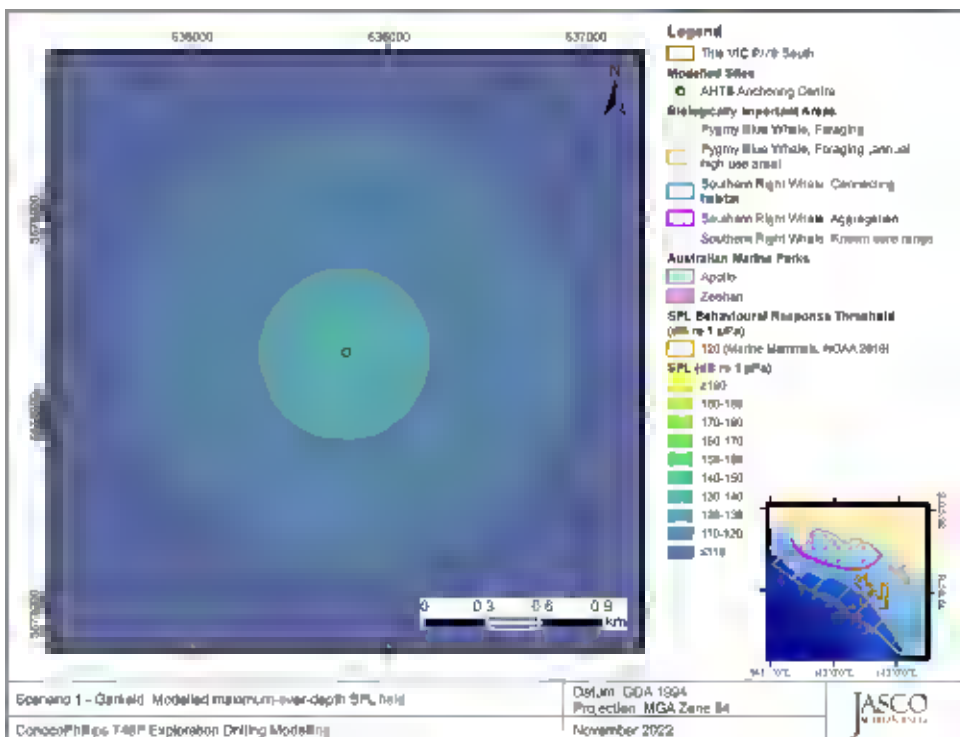


Figure 44. Scenario 1, Prelay — VIC/P79 Garfield, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

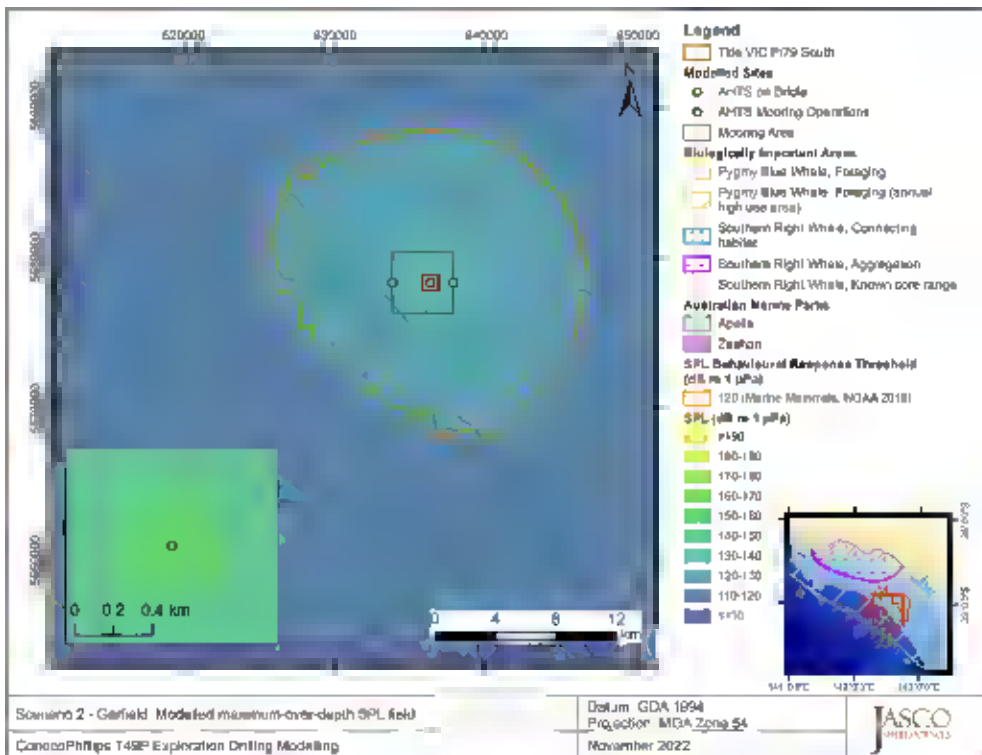


Figure 45. Scenario 2, Mooring — VIC/P79 Garfield, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

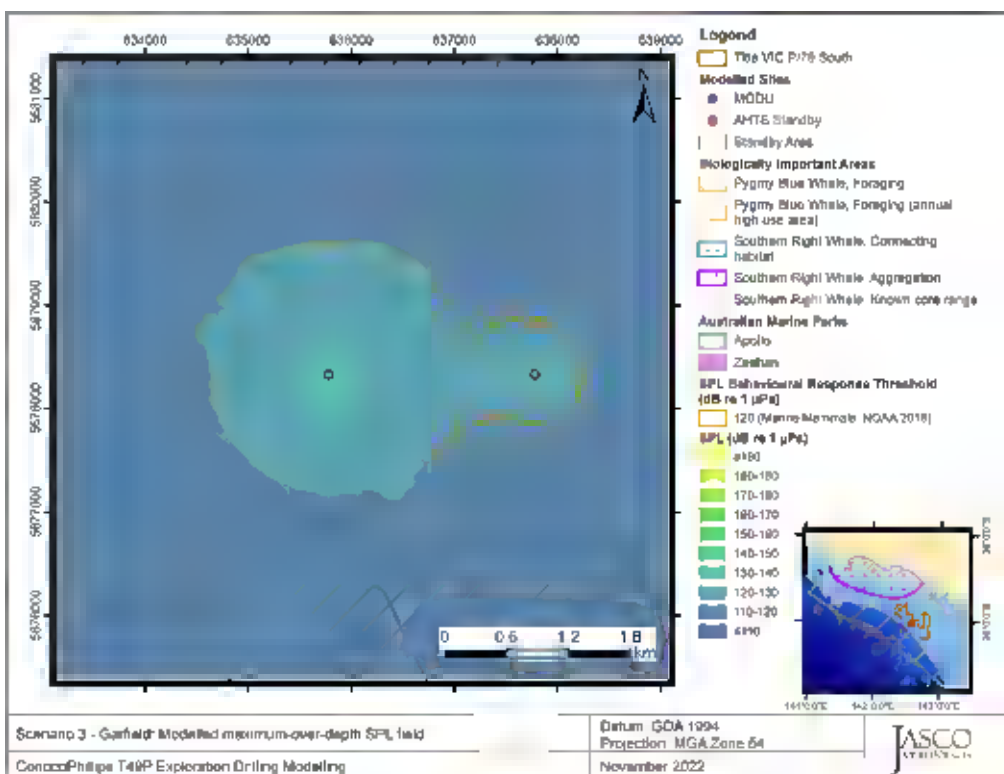


Figure 46. Scenario 5, Drilling with standby vessel — VIC/P79 Garfield, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

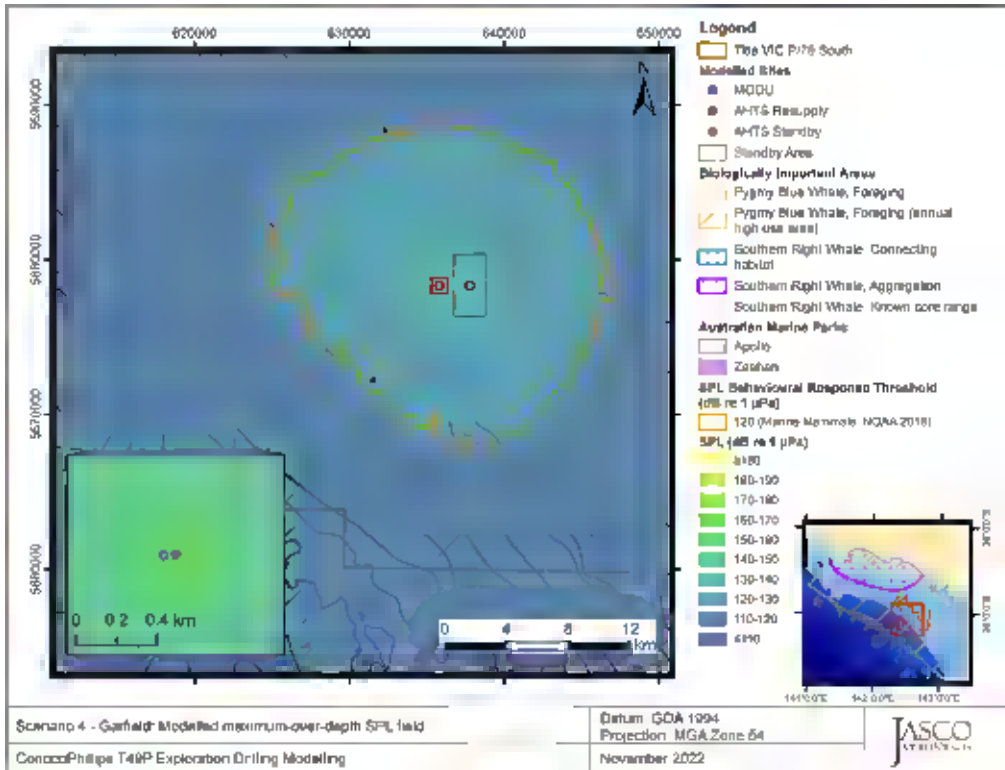


Figure 47. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Garfield, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.1.8. VIC/P79 Garfield West

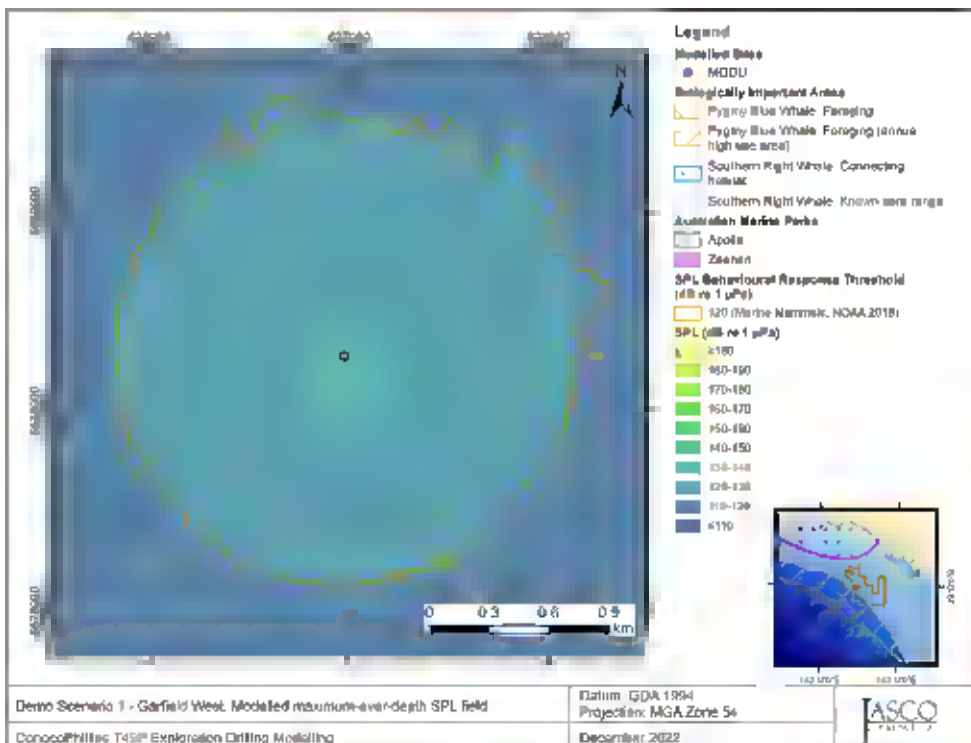


Figure 48. Scenario 3, Drilling — VIC/P79 Garfield West, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

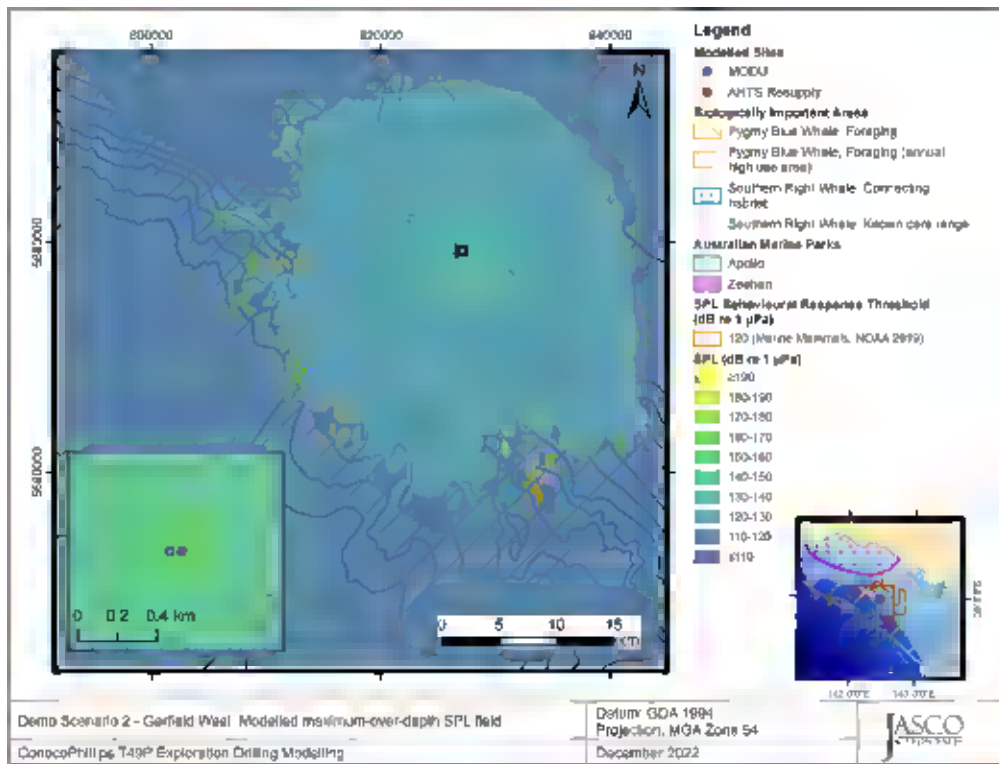


Figure 49. Scenario 4, Drilling and resupply — Garfield West, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.2. Accumulated 24 h Sound Fields

The figures below present the 24 h accumulative Sound Exposure Level maps for the operation scenarios. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.1.1 for distances.

4.1.2.2.1. T/49P British Admiral

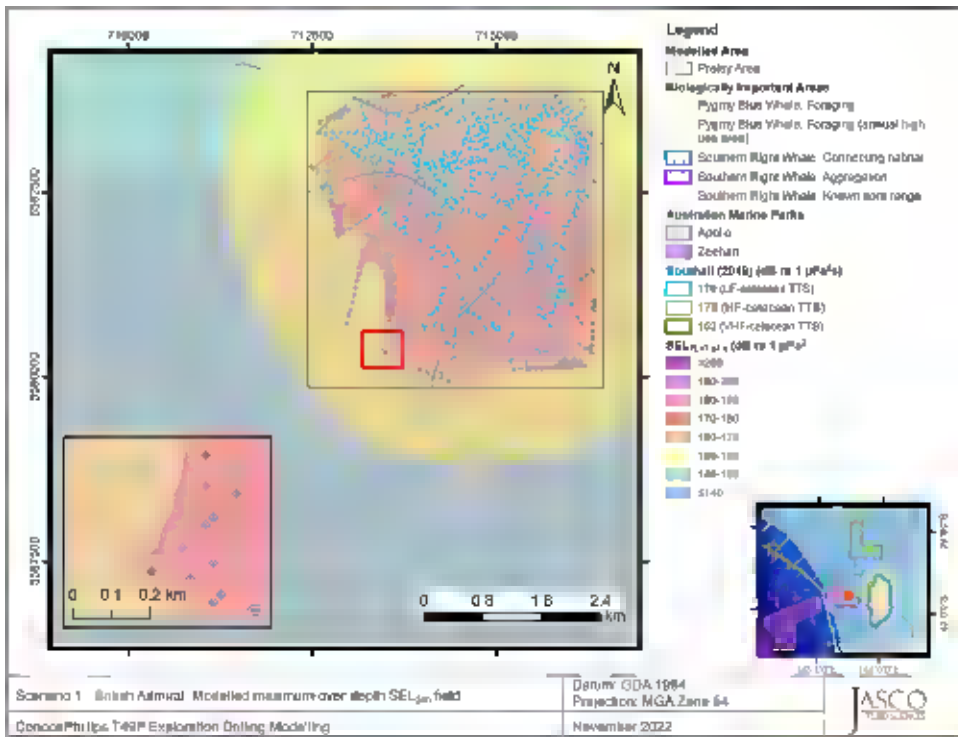


Figure 50. Scenario 1— T/49P British Admiral, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

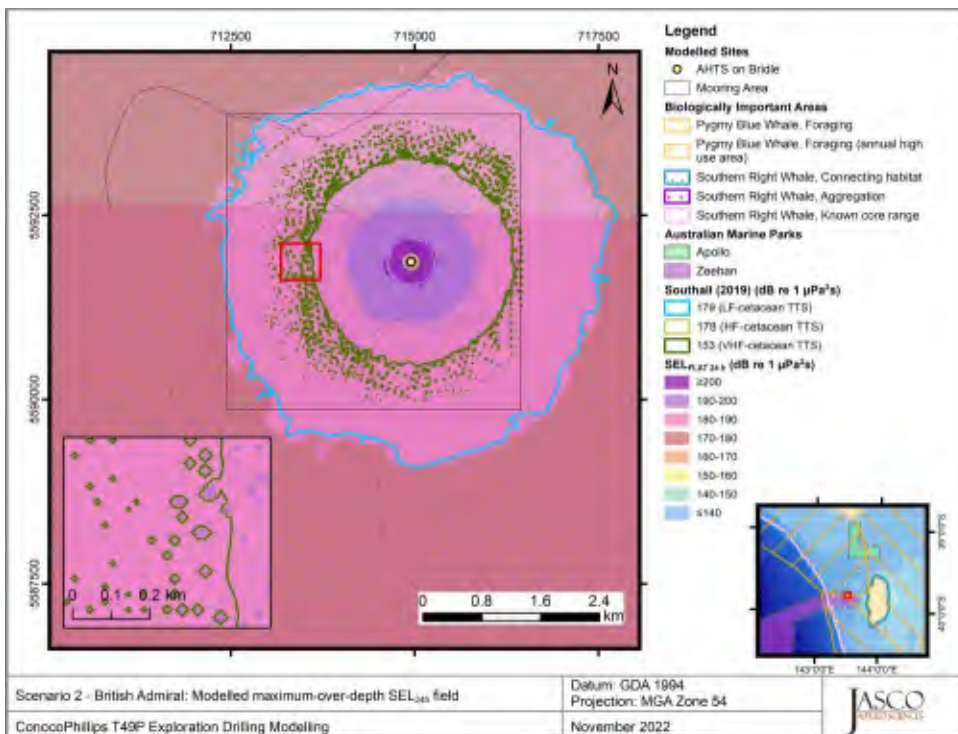


Figure 51. Scenario 2— T/49P British Admiral, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

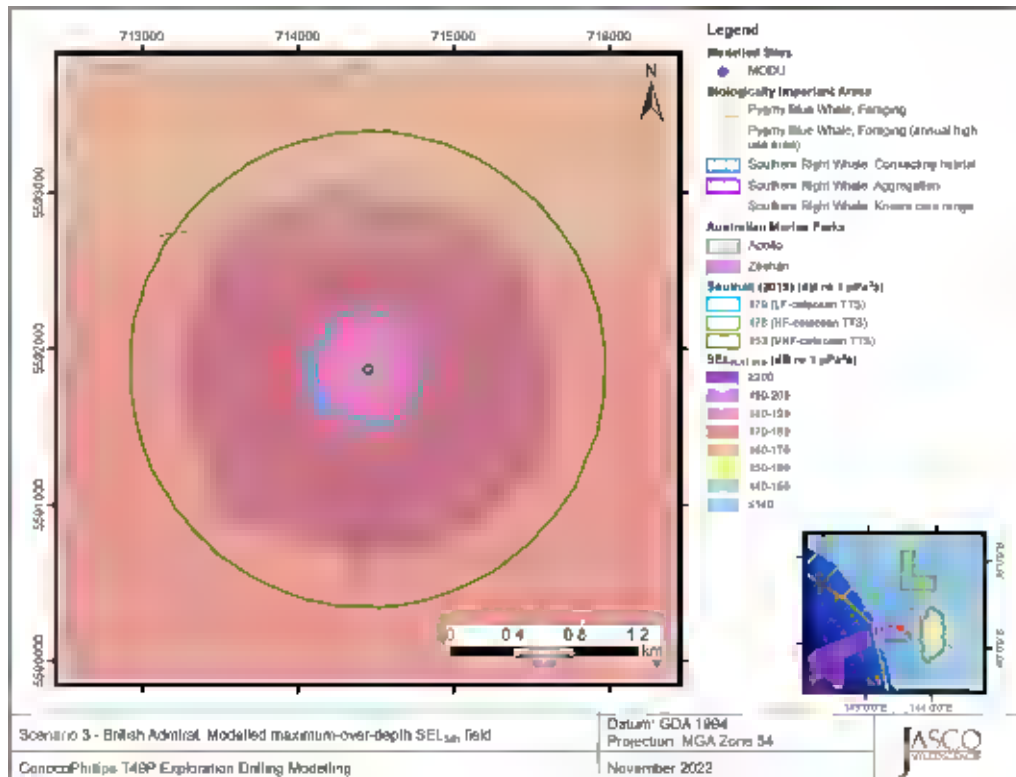


Figure 52. Scenario 3— T/49P British Admiral, SEL24h: Sound level contour map showing unweighted maximum-over-depth SEL24h field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

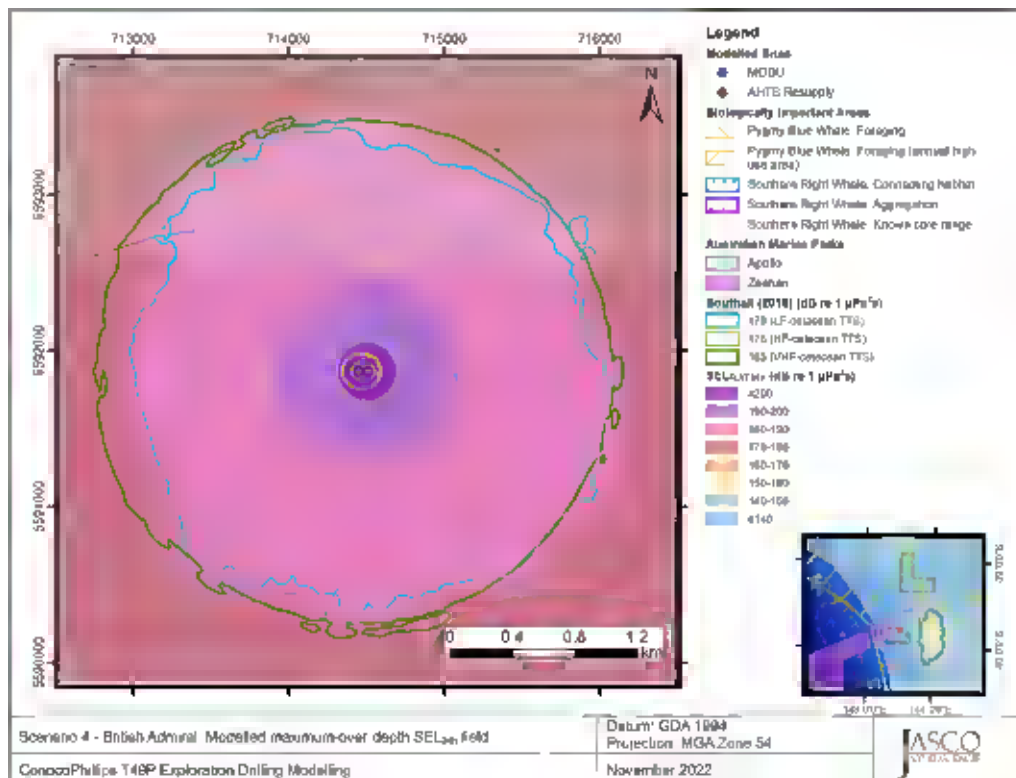


Figure 53. Scenario 4— T/49P British Admiral, SEL24h: Sound level contour map showing unweighted maximum-over-depth SEL24h field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

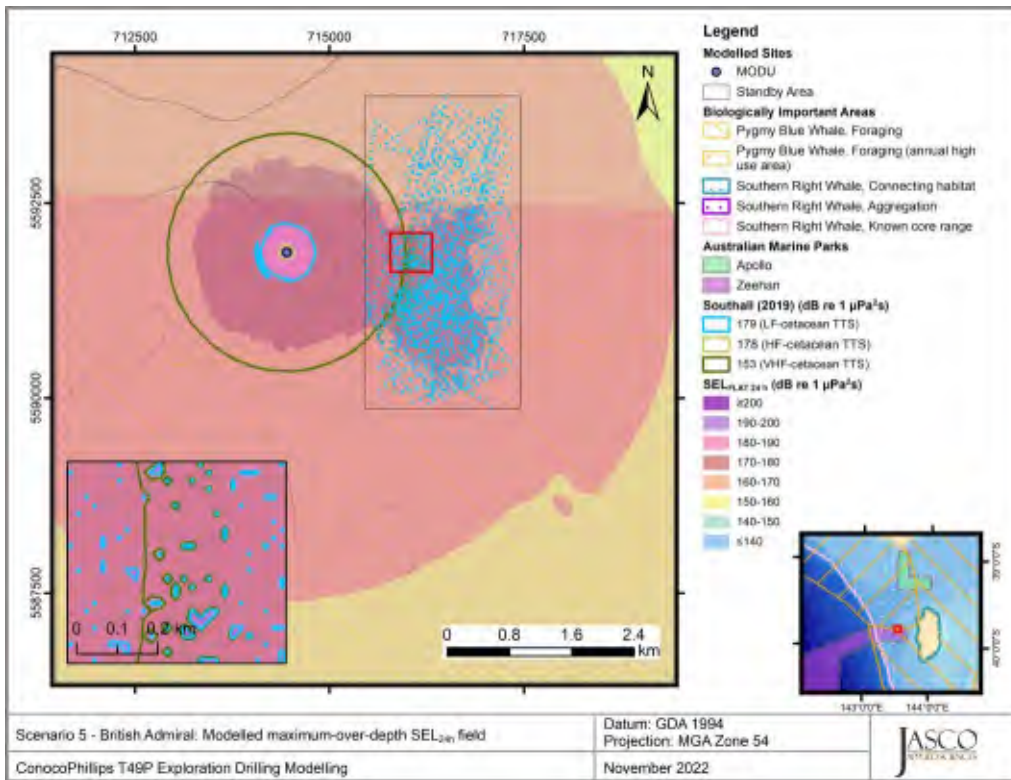


Figure 54. Scenario 5— T/49P British Admiral, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

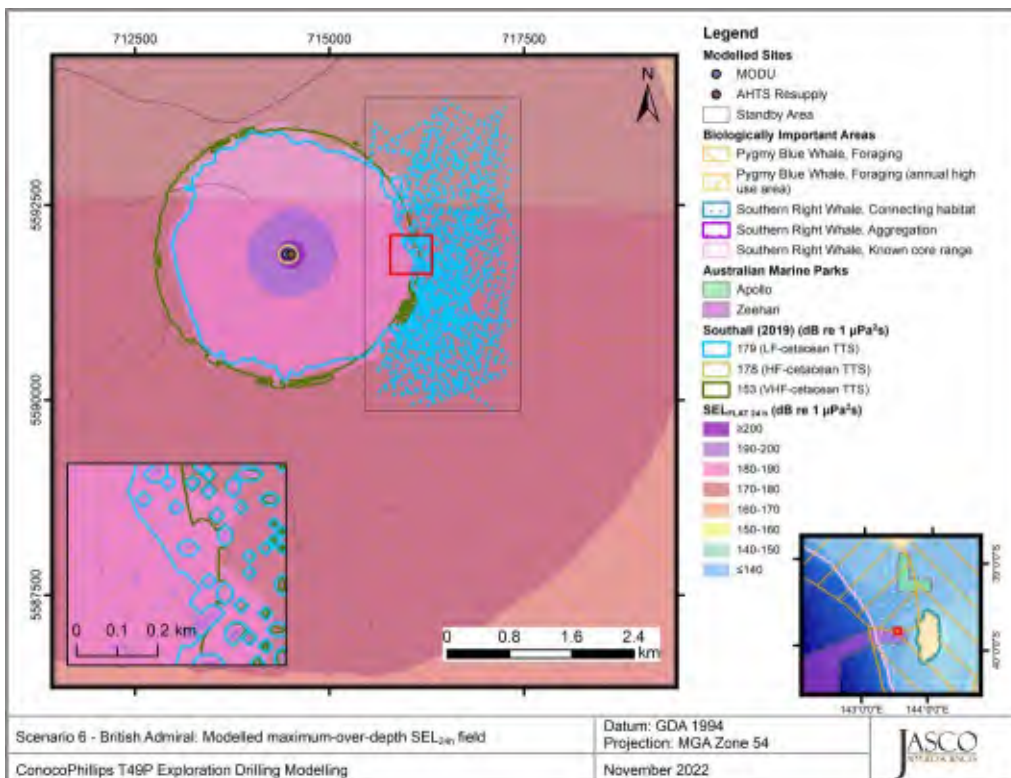


Figure 55. Scenario 6— T/49P British Admiral, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

4.1.2.2.2. T/49P Flanagan

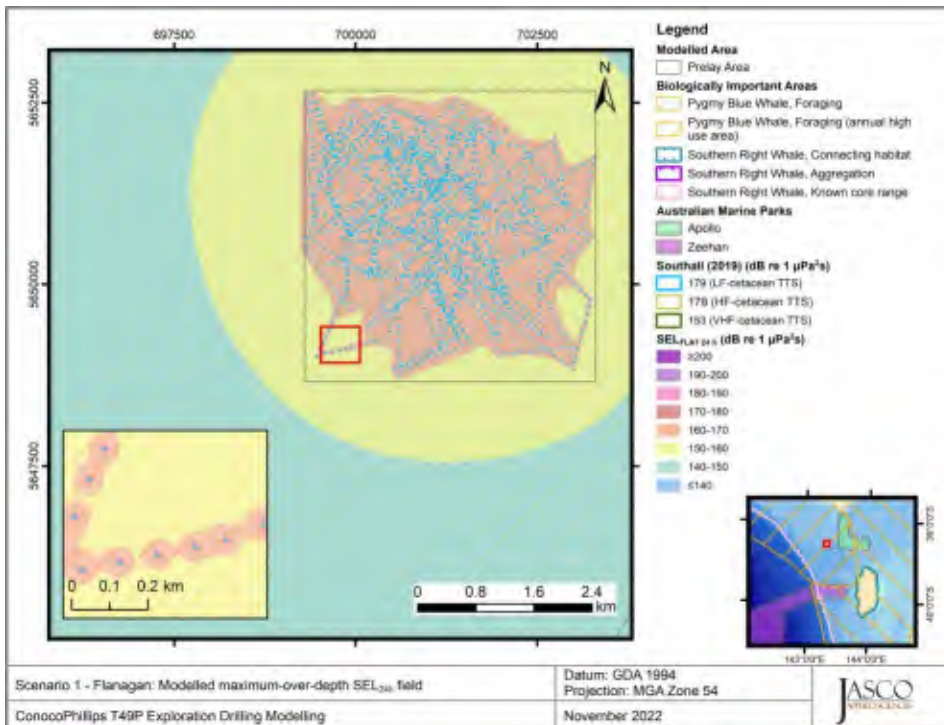


Figure 56. Scenario 1— T/49P Flanagan, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

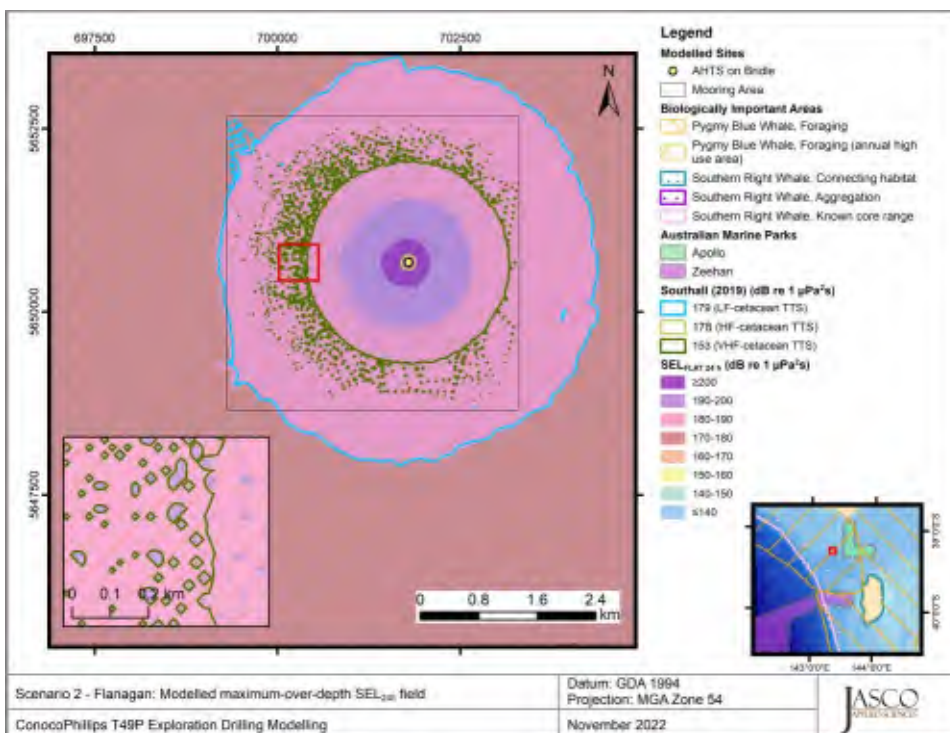


Figure 57. Scenario 2— T/49P Flanagan, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

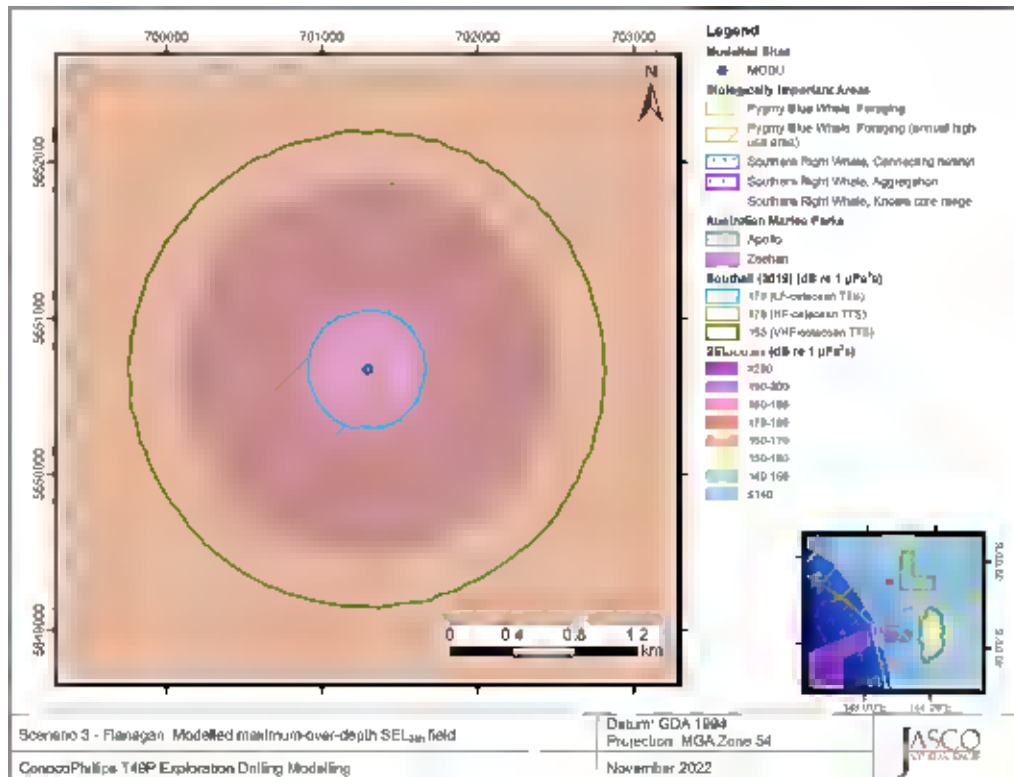


Figure 58. Scenario 3— T/49P Flanagan, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

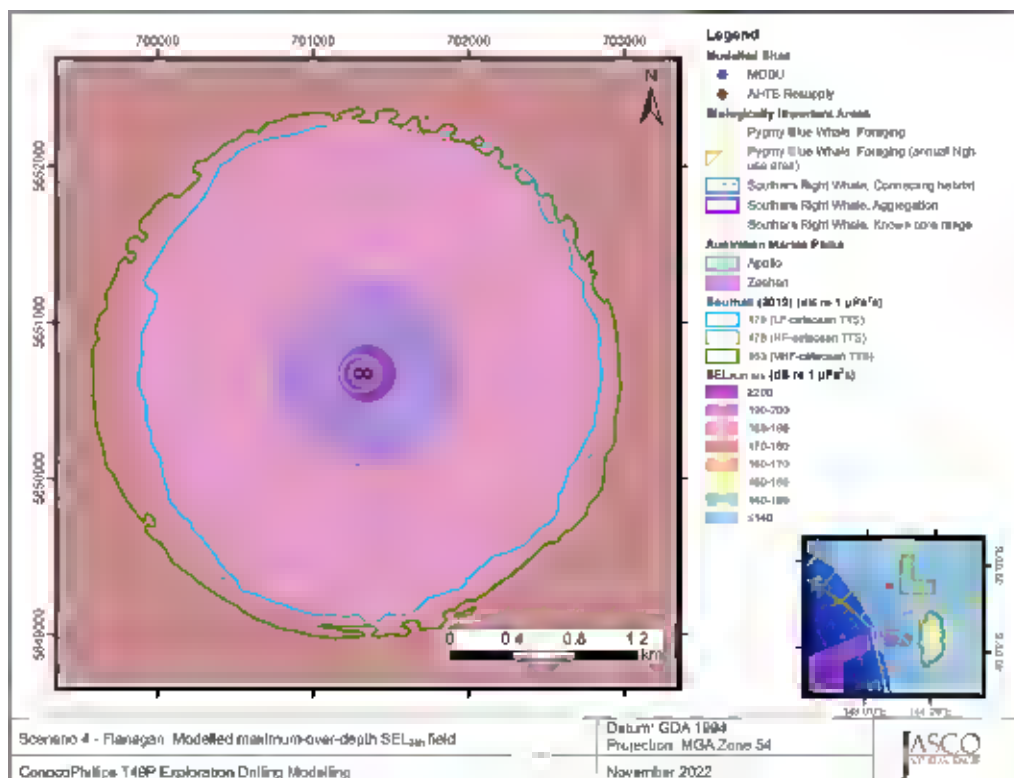


Figure 59. Scenario 4— T/49P Flanagan, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

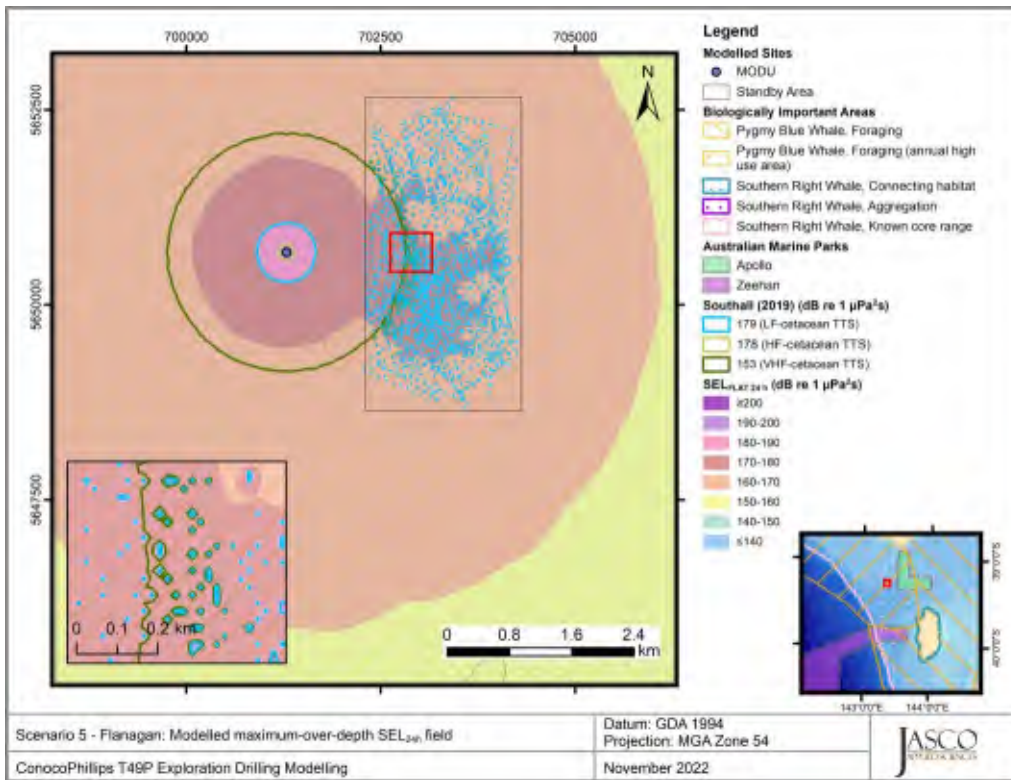


Figure 60. Scenario 5— T/49P Flanagan, SEL24h: Sound level contour map showing unweighted maximum-over-depth SEL24h field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

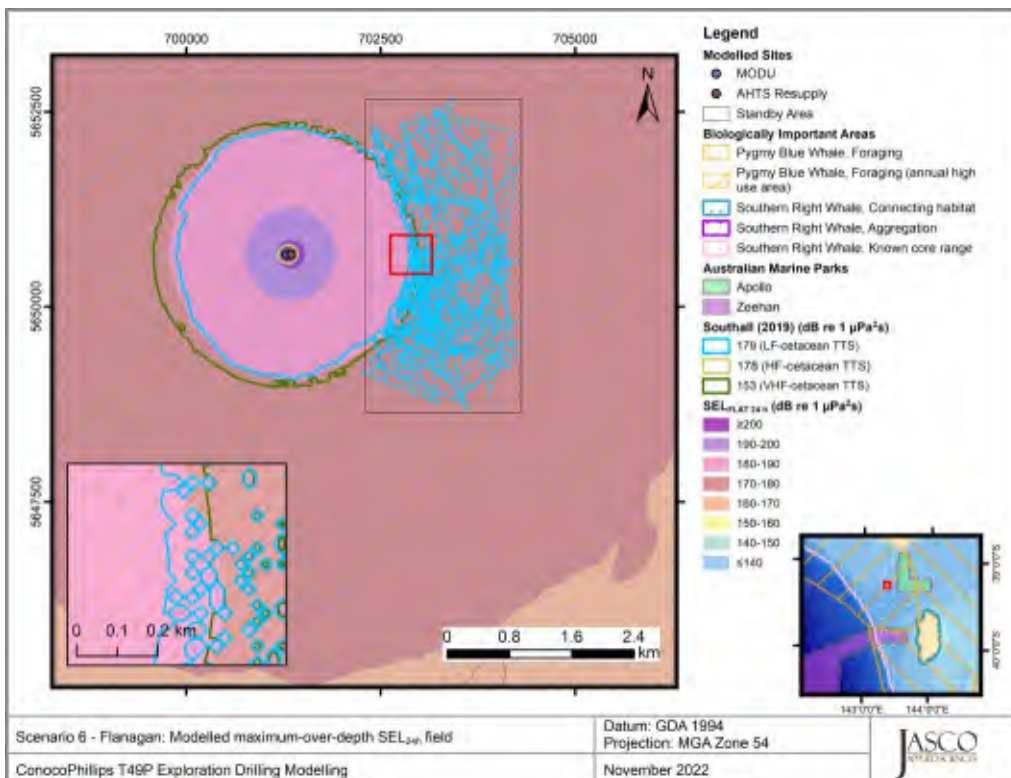


Figure 61. Scenario 6— T/49P Flanagan, SEL24h: Sound level contour map showing unweighted maximum-over-depth SEL24h field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

4.1.2.2.3. T/49P British Admiral West

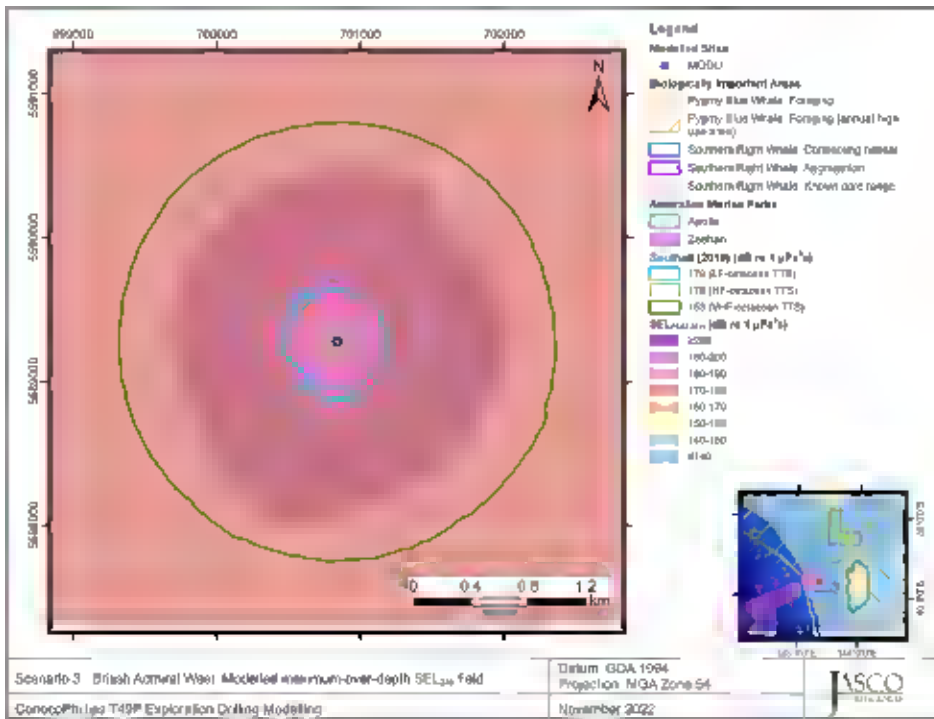


Figure 62. Scenario 3— T/49P British Admiral West, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

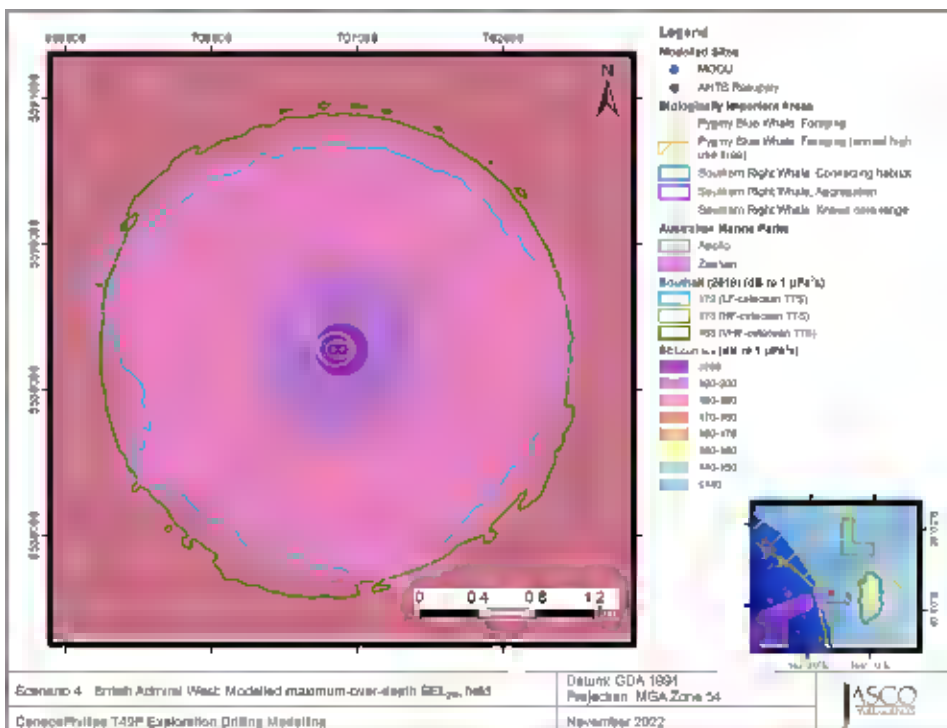


Figure 63. Scenario 4— T/49P British Admiral West, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} field and isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some for TTS were either not reached or too short to be displayed on a map.

4.1.2.2.4. VIC/P79 Merope

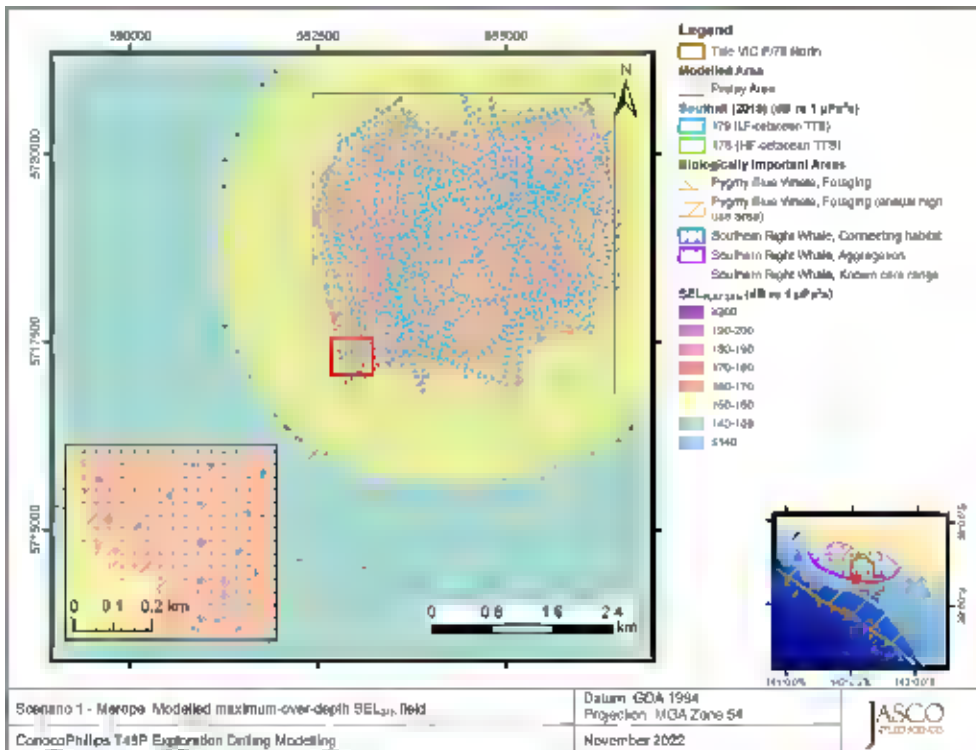


Figure 64. Scenario 1, Prelay — VIC/P79 Merope, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

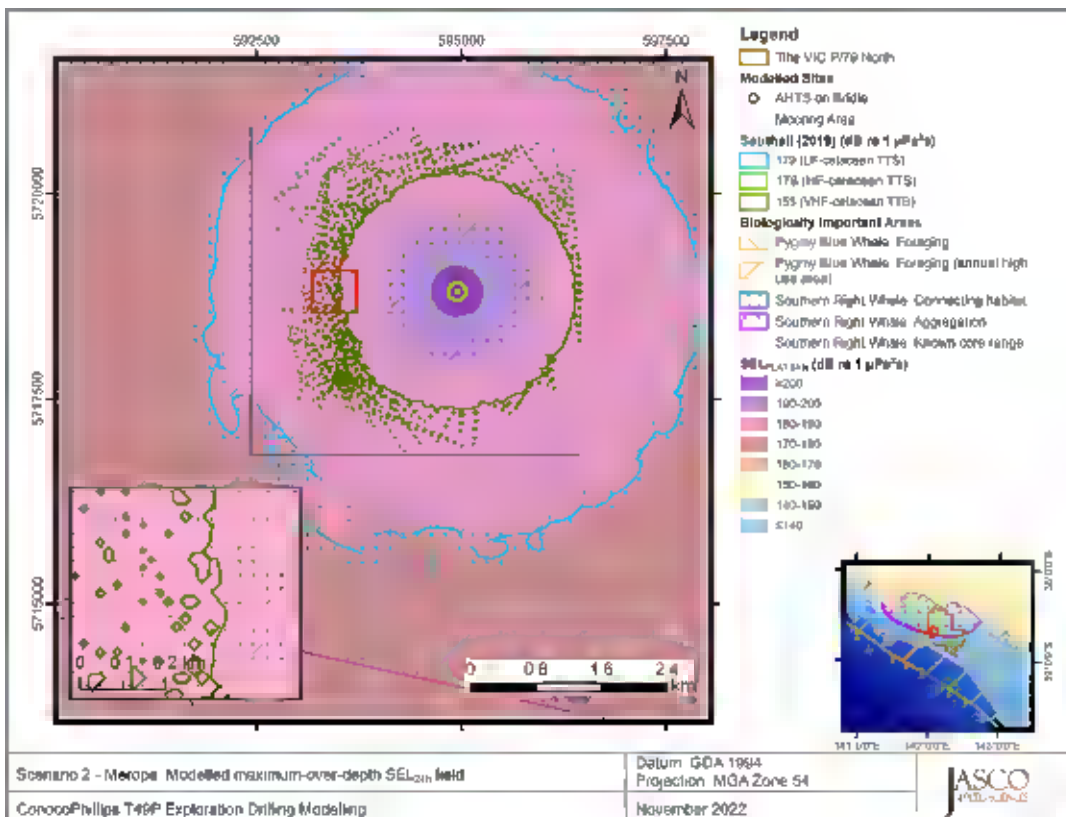


Figure 65. Scenario 2, Mooring — VIC/P79 Merope, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

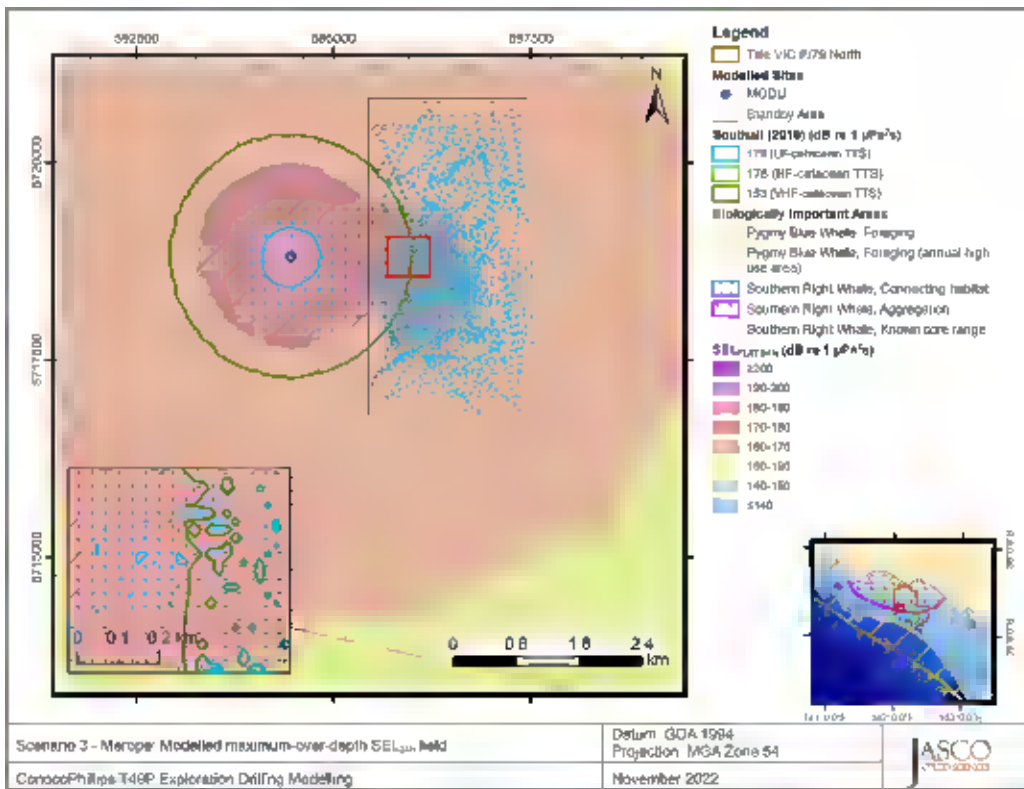


Figure 66. Scenario 5, Drilling with standby vessel — VIC/P79 Merope, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

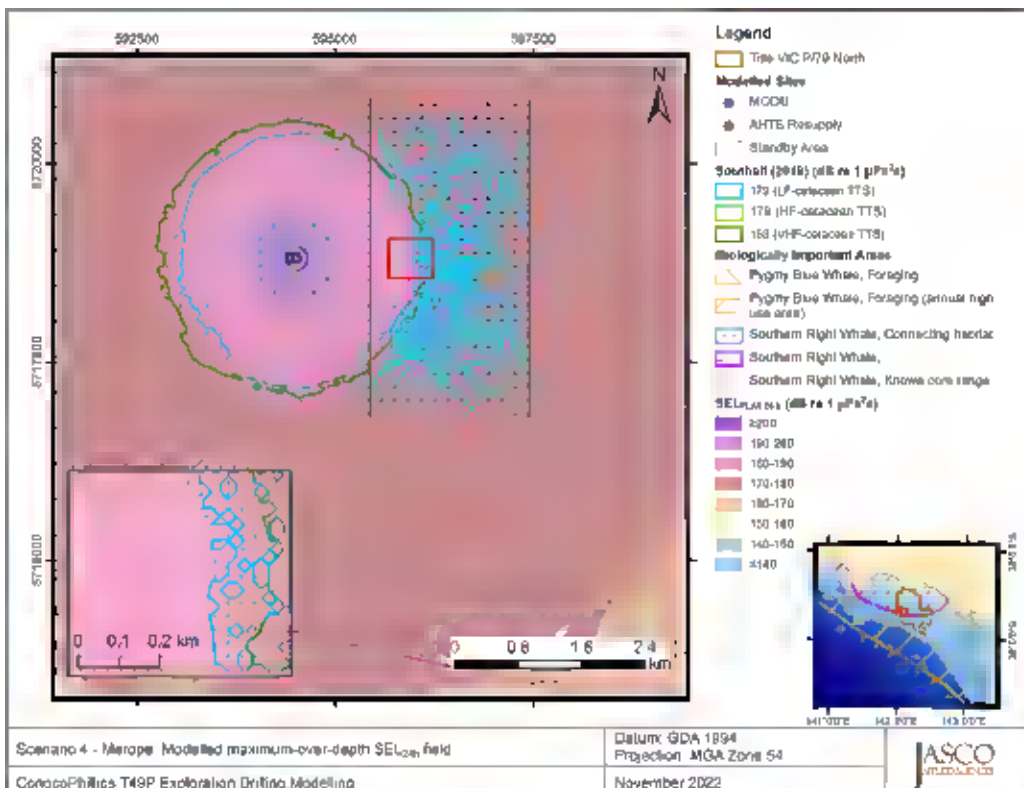


Figure 67. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Merope, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

4.1.2.2.5. VIC/P79 Julpha

Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

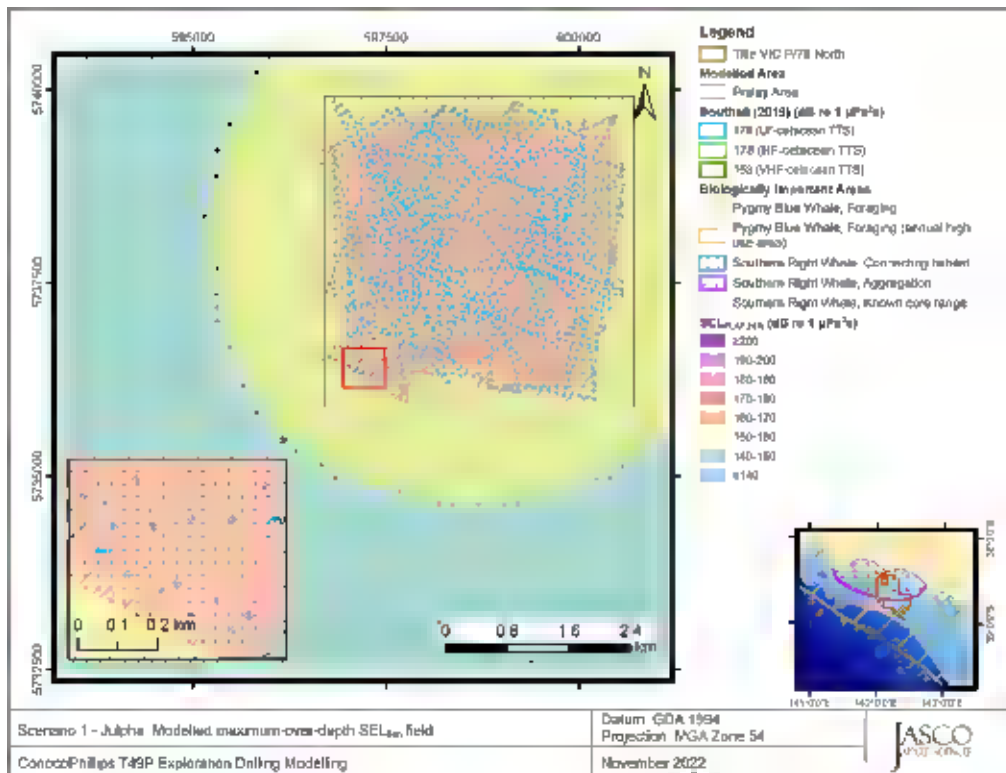


Figure 68. Scenario 1, Prelay — VIC/P79 Julpha, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

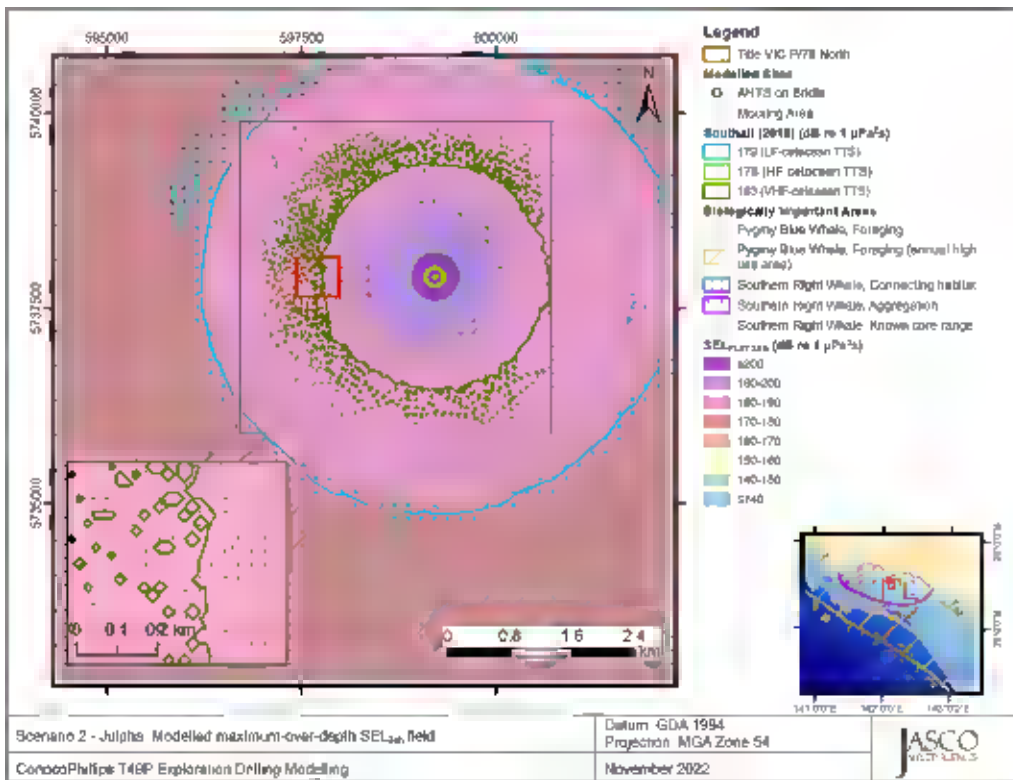


Figure 69. Scenario 2, Mooring — VIC/P79 Julpha, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

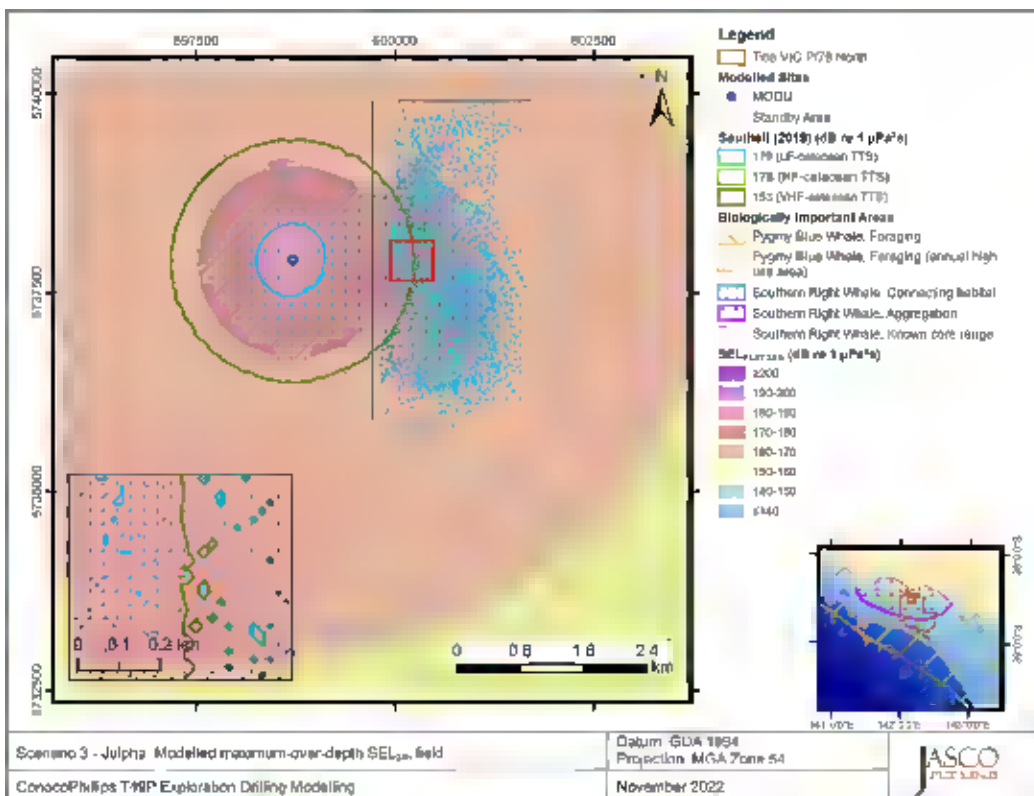


Figure 70. Scenario 5, Drilling with standby vessel — VIC/P79 Julpha, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

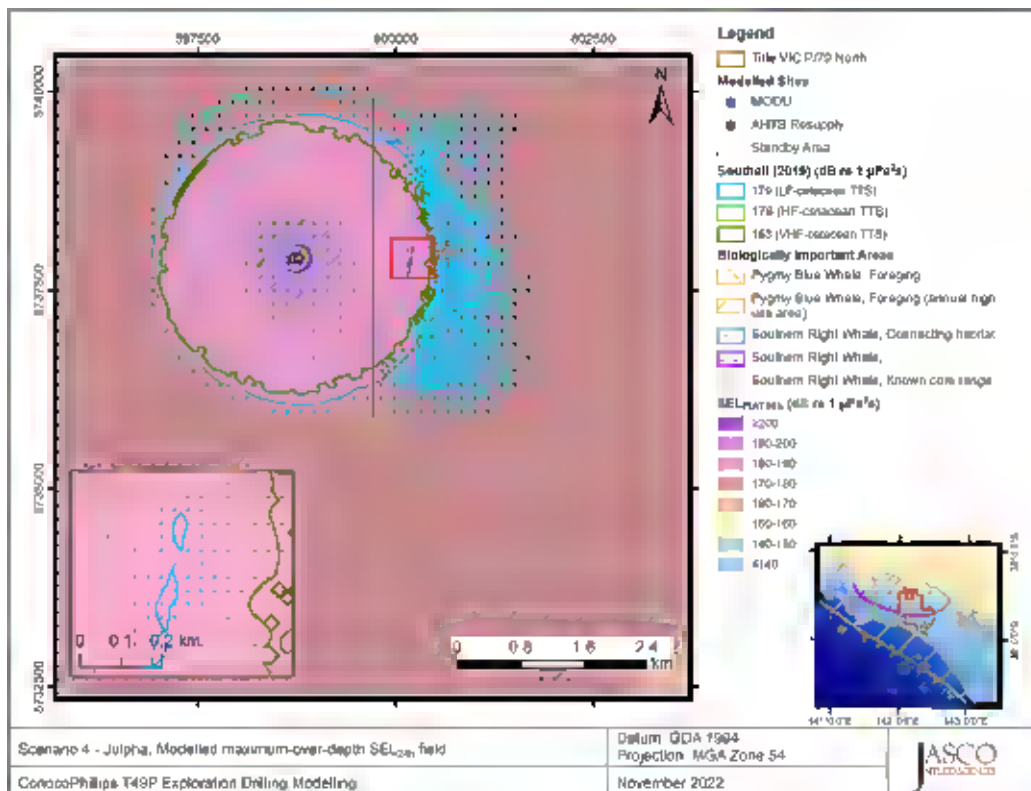


Figure 71. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Julpha, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

4.1.2.2.6. VIC/P79 Essington

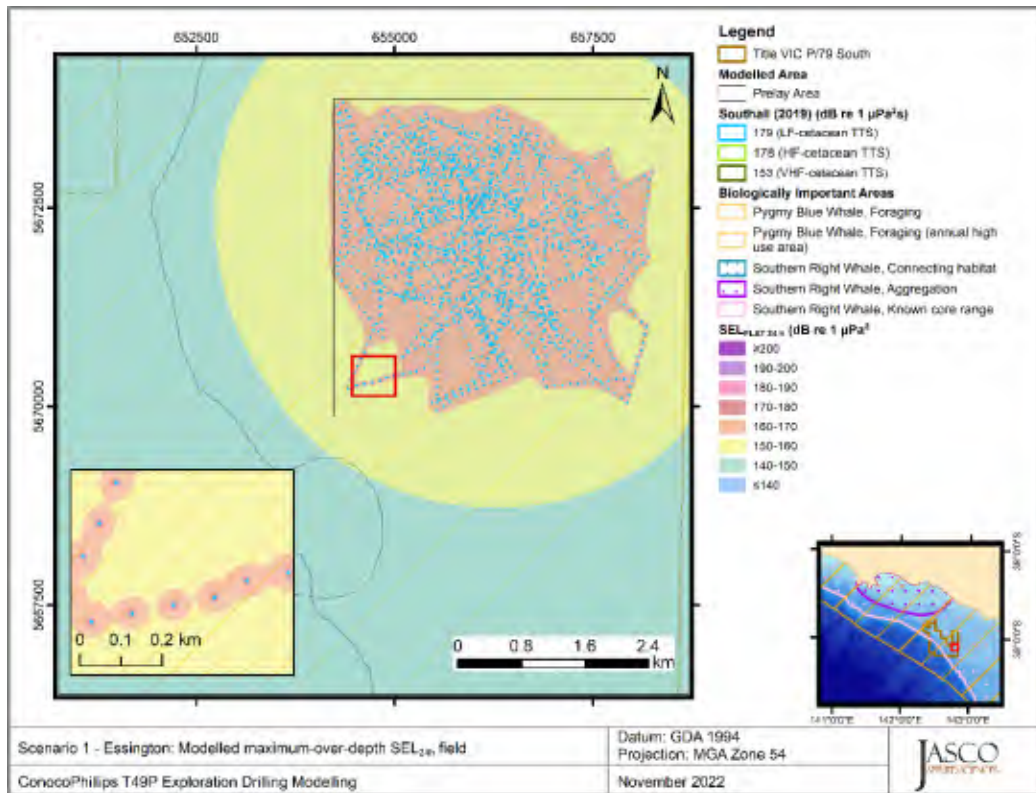


Figure 72. Scenario 1, Prelay — VIC/P79 Essington, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

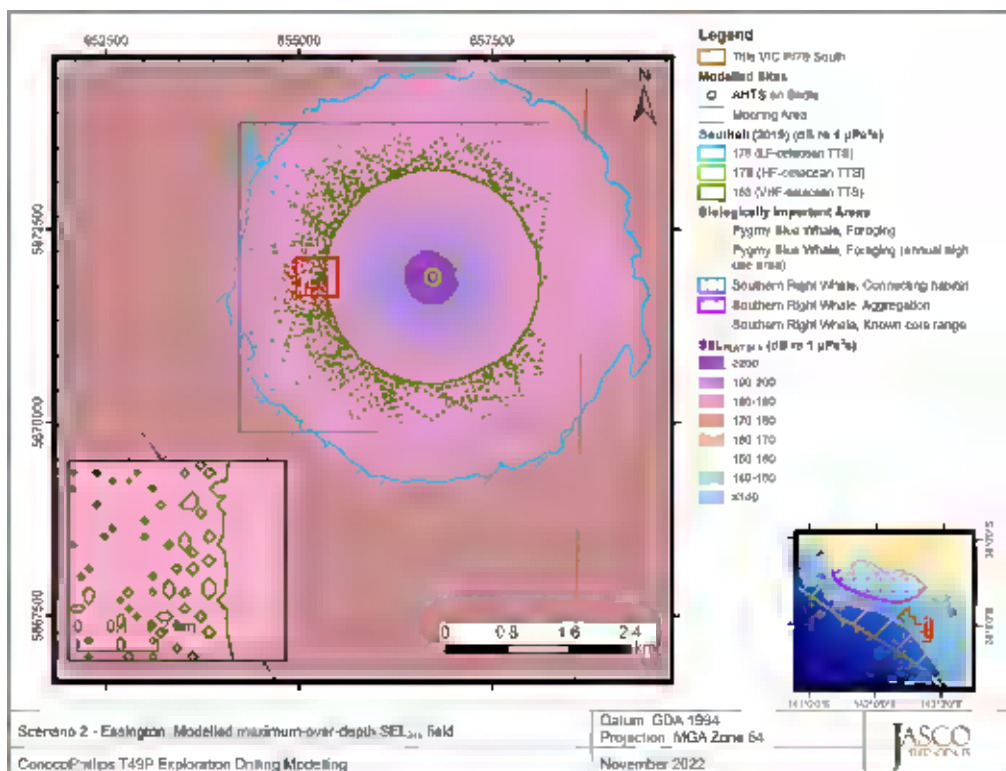


Figure 73 Scenario 2, Mooring — VIC/P79 Essington, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

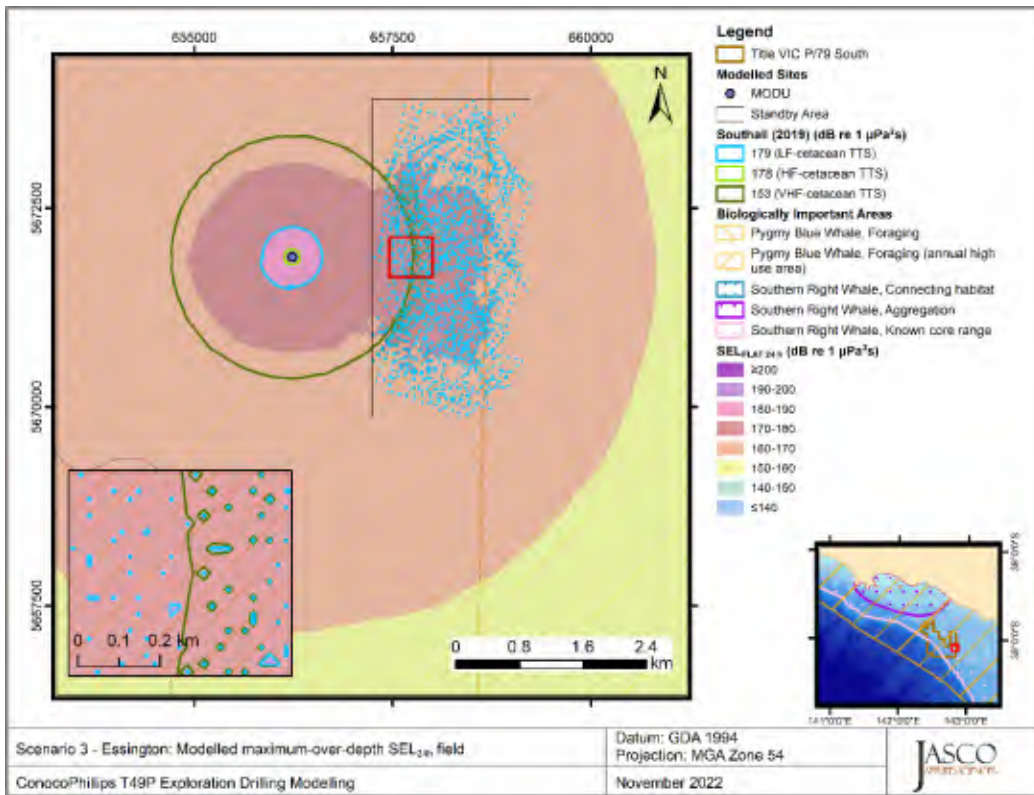


Figure 74. Scenario 5, Drilling with standby vessel — VIC/P79 Essington, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

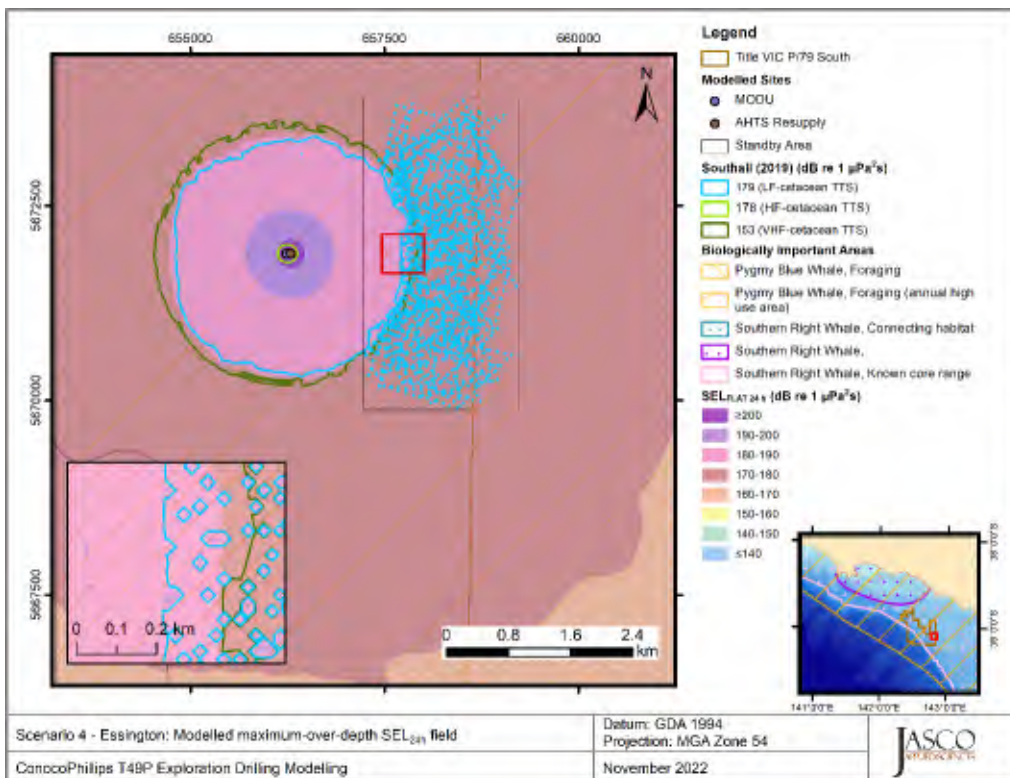


Figure 75. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Essington, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

4.1.2.2.7. VIC/P79 Garfield

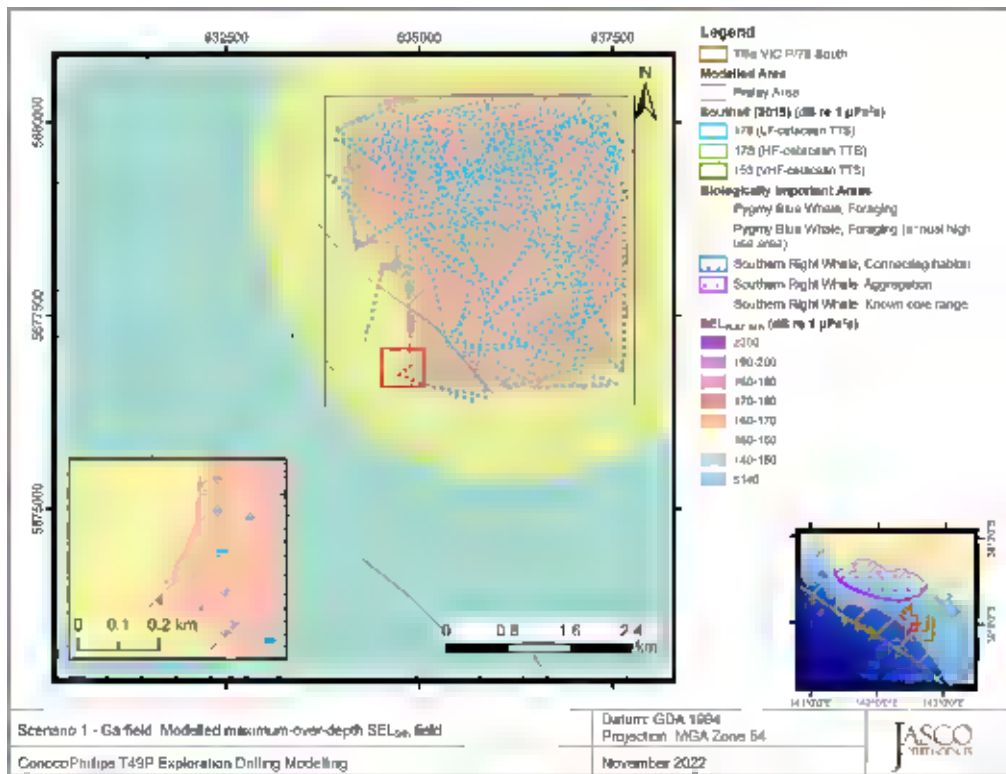


Figure 76. Scenario 1, Prelay — VIC/P79 Garfield, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

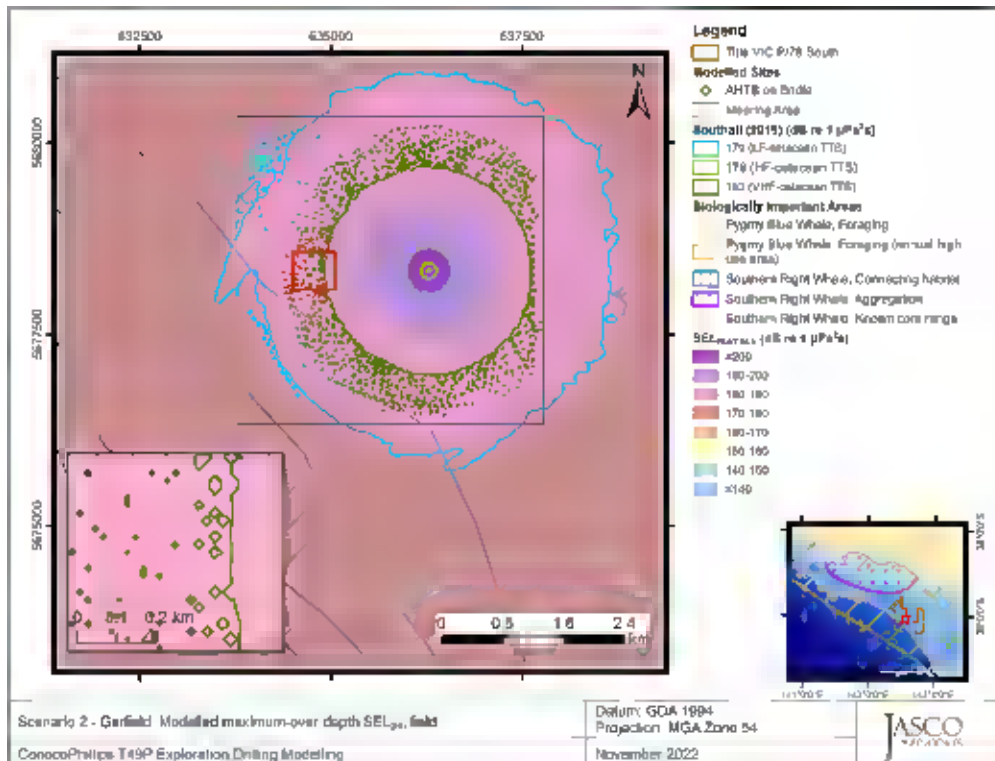


Figure 77. Scenario 2, Mooring — VIC/P79 Garfield, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

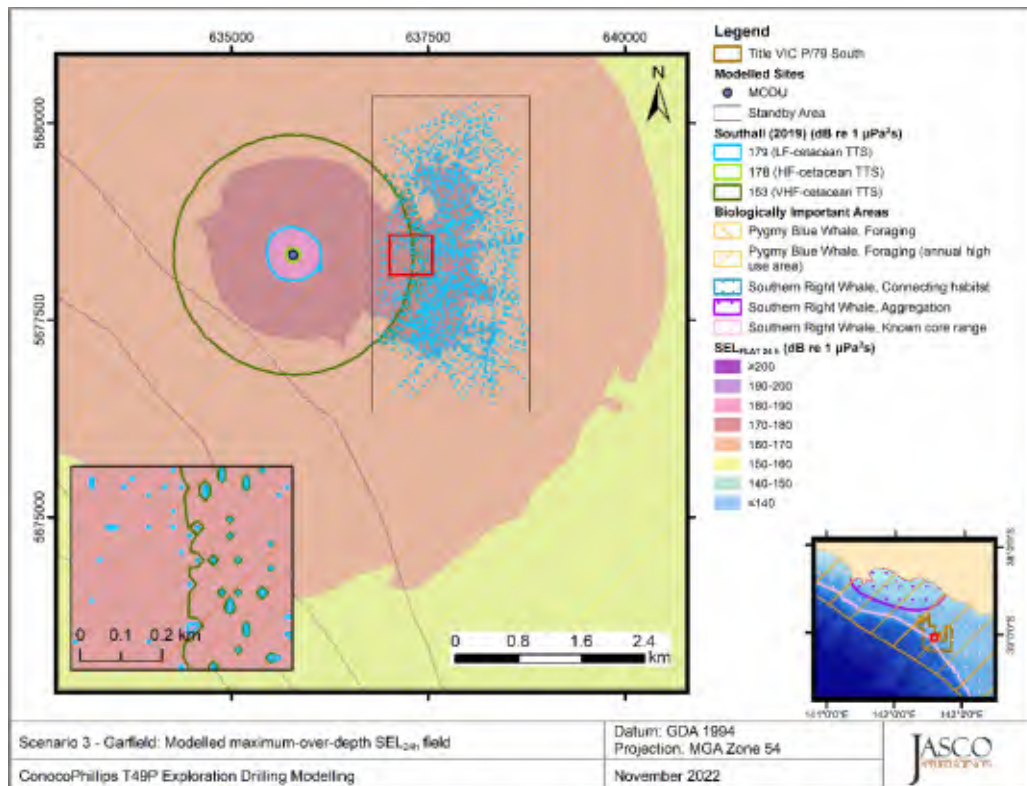


Figure 78. Scenario 5, Drilling with standby vessel — VIC/P79 Garfield, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

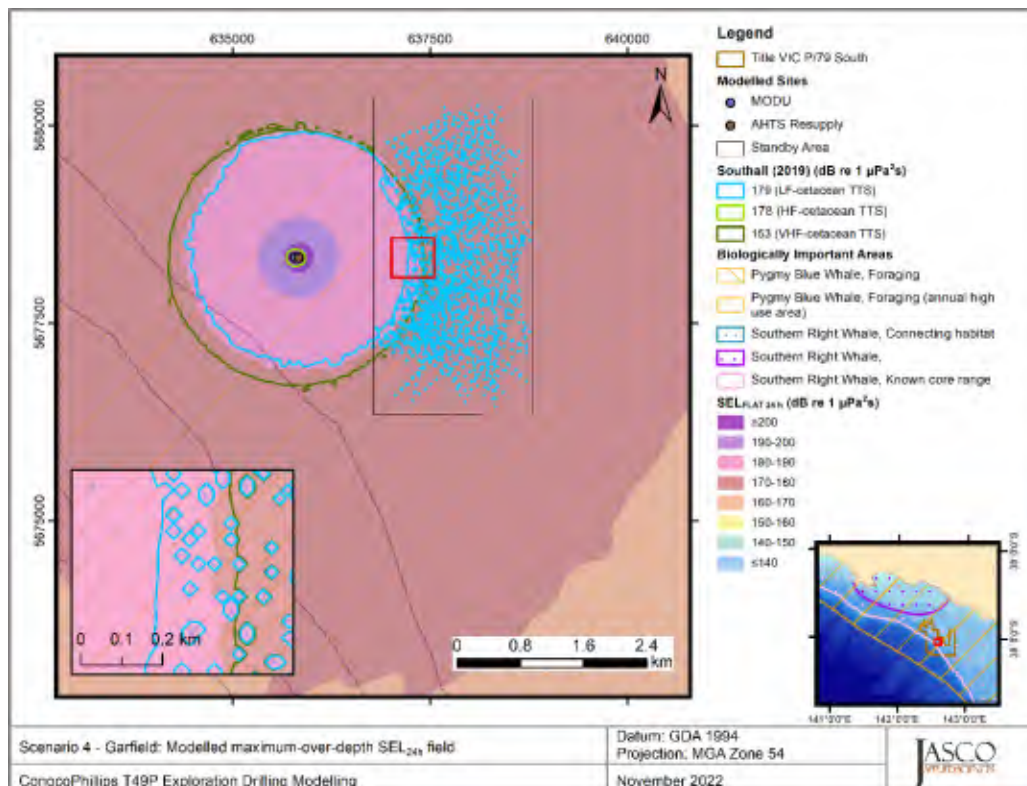


Figure 79. Scenario 6, Drilling, resupply and standby vessel — VIC/P79 Garfield, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

4.1.2.2.8. VIC/P79 Garfield West

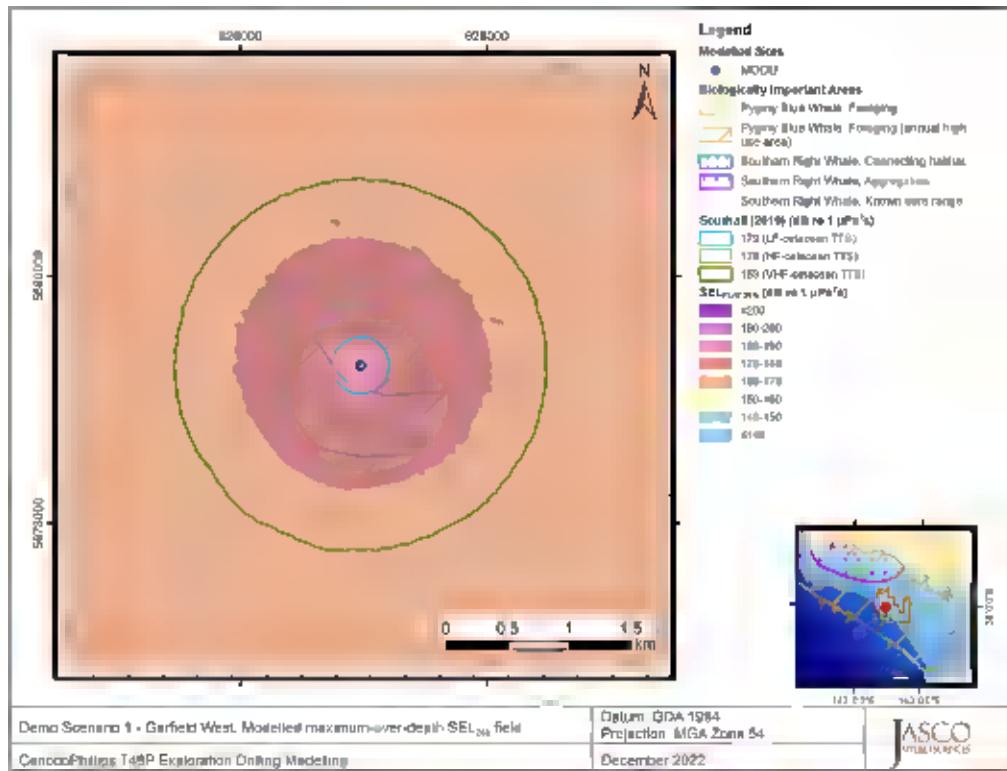


Figure 80. Scenario 3, Drilling—VIC/P79 Garfield West, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

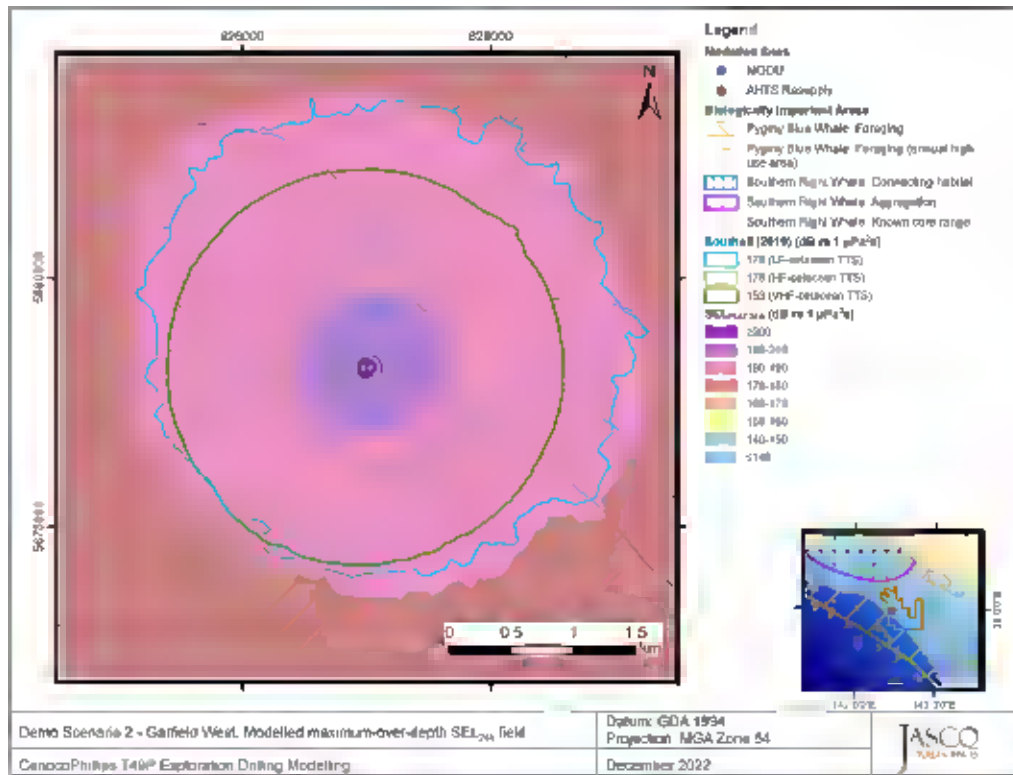


Figure 81. Scenario 4, Drilling and resupply—VIC/P79 Garfield West, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds.

4.2. Vertical Seismic Profiling (VSP)

4.2.1. Acoustic Source Levels and Directivity

AASM (Section 3.2.1) was used to predict the horizontal and vertical overpressure signatures and corresponding power spectrum levels for the seismic source, with results provided in Appendix B along with the horizontal directivity plots.

Table 31 shows the PK and per-pulse SEL source levels in the horizontal-plane broadside (perpendicular to the sagittal plane of the array), endfire (parallel to the sagittal plane of the array), and vertical directions. The vertical source level that accounts for the ‘surface ghost’ (the out of phase reflected pulse from the water surface) is also presented to make it easier to compare the output of other seismic source models.

Appendix B.3 shows the broadside, endfire, and vertical overpressure signature and corresponding power spectrum levels for the source. The signature consists of a strong primary peak, related to the initial release of high-pressure air, followed by a series of pulses associated with bubble oscillations. Most energy was produced at frequencies below 300 Hz. Frequency-dependent peaks and nulls in the spectrum result from interference among airguns in the source and correspond with the volumes and relative locations of the airguns to each other.

Table 31. Far-field source level specifications for the 750 in³ Vertical Seismic Profiling (VSP) array, for a 5 m source depth. Source levels are for a point-like acoustic source with equivalent far-field acoustic output in the specified direction. Sound level metrics are per-pulse and unweighted.

Direction	Peak source pressure level ($L_{S,pk}$; dB re 1 μ Pa m)	Per-pulse source SEL ($L_{S,E}$; dB 1 μ Pa ² m ² s)	
		10–2000 Hz	2000–25000 Hz
Broadside	239.3	214.5	168.8
Endfire	239.4	214.5	165.8
Vertical	239.2	214.5	173.6
Vertical (surface affected source level)	239.3	216.1	176.3

4.2.2. Per-Pulse Sound Fields

This section presents the per-pulse sound fields in terms of maximum-over-depth SPL, SEL, PK, and seafloor PK and PK-PK. The different metrics are presented for the following reasons:

- Per-pulse SEL sound fields (Table 32) are used as inputs into the 24 h SEL scenario and to provide context for the range to 160 dB re 1 μ Pa²-s, relevant for the EPBC Act Policy Statement 2.1 (DEWHA 2008).
- SPL sound fields (Table 33) were used to determine the distances to marine mammal and turtle behavioural thresholds (see Sections 2.1 and 2.2). In addition, the maximum distance to the low-frequency weighted SPL 140 dB is presented in Table 34.
- PK metrics within the water column (Table 35) are relevant to thresholds and guidelines for marine mammals, sea turtles, fish, fish eggs and larvae (as well as plankton; see Sections 2.1 and 2.2).
- PK metrics at the seafloor (Table 36) are relevant to guidelines for fish, fish eggs and larvae (Section 3.4).
- PK-PK metrics at the seafloor (Table 37) are relevant to sound levels used in assessing effect on benthic invertebrates (see Section 2.3).

The SPL sound fields, and distances to relevant isopleths can be visualised on the contour maps presented in Section 4.2.4.1.

Table 32. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the 750 in³ Vertical Seismic Profiling (VSP) array to modelled maximum-over-depth unweighted per-pulse sound exposure level (SEL) isopleths for nominal drilling locations.

Per-pulse SEL (L_E ; dB re 1 μ Pa ² -s)	T/49P British Admiral		T/49P Flanagan		VIC/P79 Julpha		VIC/P79 Garfield	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
190	–	–	–	–	–	–	–	–
180	0.05	0.05	0.05	0.05	0.07	0.07	0.05	0.05
170	0.26	0.25	0.26	0.25	0.23	0.22	0.25	0.24
160 ^a	0.72	0.69	0.71	0.69	0.61	0.59	0.94	0.89
150	1.91	1.79	1.94	1.87	1.48	1.43	3.02	2.75
140	4.51	4.14	4.28	4.00	3.76	3.52	8.83	7.45
130	8.44	7.68	8.11	7.74	13.6	12.0	29.8	24.2
120	16.9	16.1	17.4	16.3	32.1	27.4	>100	/
110	29.8	27.6	31.8	28.9	48.1	42.1		

^a Low power zone assessment criteria DEWHA (2008).

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

A slash indicates that $R_{95\%}$ is not reported when the R_{max} was greater than the maximum modelling extent.

Table 33. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the 750 in³ Vertical Seismic Profiling (VSP) array to modelled maximum-over-depth unweighted per-pulse sound pressure level (SPL) isopleths for nominal drilling locations.

SPL (L_p ; dB re 1 μ Pa)	T/49P British Admiral		T/49P Flanagan		VIC/P79 Julpha		VIC/P79 Garfield	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
200	–	–	–	–	–	–	–	–
190	0.04	0.04	0.04	0.04	0.06	0.06	0.05	0.05
180	0.23	0.22	0.23	0.23	0.22	0.21	0.23	0.23
175 ^a	0.36	0.34	0.37	0.36	0.37	0.36	0.35	0.34
170	0.63	0.61	0.65	0.63	0.59	0.57	0.61	0.58
166 ^b	0.92	0.88	0.92	0.88	0.83	0.79	0.89	0.86
160 ^c	1.49	1.41	1.50	1.46	1.40	1.33	1.48	1.37
150	3.37	3.13	3.26	3.14	3.32	3.07	3.86	3.22
140	7.47	7.10	7.62	7.28	8.99	8.36	9.99	8.34
130	14.6	13.3	16.2	14.8	23.1	21.1	21.4	17.3
120	27.4	25.9	29.1	27.0	38.5	35.5	>100	/

^a Threshold for turtle behavioural disturbance from impulsive noise (McCauley et al. 2000a).

^b Threshold for turtle behavioural response to impulsive noise (McCauley et al. 2000a).

^c Marine mammal behavioural threshold for impulsive sound sources (NOAA 2019).

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

A slash indicates that $R_{95\%}$ is not reported when the R_{max} was greater than the maximum modelling extent.

Table 34. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the 750 in³ Vertical Seismic Profiling (VSP) array to modelled maximum-over-depth low-frequency cetacean weighted per-pulse sound pressure level (SPL) 140 dB isopleth for both drilling locations.

LF cetacean weighted SPL ($L_{p,LF}$; dB re 1 μ Pa)	T/49P British Admiral		T/49P Flanagan		VIC/P79 Julpha		VIC/P79 Garfield	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
140 ^a	5.35	5.03	5.35	5.03	6.39	6.02	6.48	5.37

^a Marine mammal behavioural response threshold for a 50% probability of response for impulsive sound sources (adapted from Wood et al. (2012)).

Table 35. VSP, PTS, and TTS PK thresholds: Maximum (R_{max}) horizontal distances (m) from the 750 in³ Vertical Seismic Profiling (VSP) array to modelled maximum-over-depth peak pressure level (PK) PTS and TTS thresholds for marine mammals (Southall et al. 2019), fish (Popper et al. 2014), and sea turtles (Finneran et al. 2017) for nominal drilling locations.

Hearing group		PK threshold (L_{pk} ; dB re 1 μ Pa)	<i>British Admiral</i>	<i>Flanagan</i>	<i>Julpha</i>	<i>Garfield</i>
			Distance R_{max} (km)	Distance R_{max} (km)	Distance R_{max} (km)	Distance R_{max} (km)
LF cetaceans	PTS	219	–	–	–	–
	TTS	213	–	–	–	–
HF cetaceans	PTS	230	–	–	–	–
	TTS	224	–	–	–	–
VHF cetaceans	PTS	202	0.06	0.06	0.11	0.06
	TTS	196	0.25	0.24	0.21	0.14
Otariid pinnipeds in water	PTS	232	–	–	–	–
	TTS	226	–	–	–	–
Sea turtles	PTS	232	–	–	–	–
	TTS	226	–	–	–	–
Fish: No swim bladder (also applied to sharks)		213	–	–	–	–
Fish: Swim bladder not involved in hearing, Swim bladder involved in hearing, Fish eggs, and larvae		207	0.04	0.04	0.05	–

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Table 36. VSP, seafloor PK: Maximum (R_{max}) horizontal distances (in m) from the 750 in³ Vertical Seismic Profiling (VSP) array to modelled seafloor peak pressure level thresholds (Popper et al. 2014) (PK) for nominal drilling locations.

Hearing group/animal type	PK threshold (L_{pk} ; dB re 1 μ Pa)	<i>British Admiral</i>	<i>Flanagan</i>	<i>Julpha</i>	<i>Garfield</i>
		Distance R_{max} (m)	Distance R_{max} (m)	Distance R_{max} (m)	Distance R_{max} (m)
Fish: No swim bladder (also applied to sharks)	213			*	
Fish: Swim bladder not involved in hearing; Swim bladder involved in hearing Sea turtles, fish eggs, and larvae	207	*	*	45.5	*

An asterisk indicates that the sound level was not reached.

Table 37. Maximum (R_{max}) horizontal distances (in m) from the 750 in³ Vertical Seismic Profiling (VSP) array to modelled seafloor peak-peak pressure levels (PK-PK) for nominal drilling locations.

PK-PK (L_{pk-pk} ; dB re 1 μ Pa)	<i>British Admiral</i>	<i>Flanagan</i>	<i>Julpha</i>	<i>Garfield</i>
	Distance R_{max} (m)	Distance R_{max} (m)	Distance R_{max} (m)	Distance R_{max} (m)
213 ^{a,b,c}	*	*	27.5	*
212 ^{b,c}	*	*	39.0	*
210 ^{a,b}	*	*	61.8	*
209 ^{a,b}	*	*	74.2	*
202 ^d	169	164	137.3	169.6

^a Day et al. (2019), lobster

^b Day et al. (2016a), lobster and scallops

^c Day et al. (2017), scallops.

^d Payne et al. (2008), lobster

An asterisk indicates that the sound level was not reached.

4.2.3. Multiple Pulse Sound Fields

This section presents the sound fields in terms of SEL accumulated over 24 h of activity, for the modelled scenarios (Table 11). Frequency-weighted SEL_{24h} sound fields were used to estimate the maximum and 95% distances (R_{max} and $R_{95\%}$; calculated as detailed in Appendix D.3) to marine mammals and turtle PTS and TTS thresholds (listed in Table 38), and to estimate maximum distance and the area to injury and TTS guidelines for fish (Table 39).

Table 38. VSP, multiple-pulse SEL: Maximum-over-depth distances (in km) to frequency-weighted SEL_{24h} based PTS and TTS thresholds for marine mammals Southall et al. (2019) and sea turtles (Finneran et al. 2017) from Vertical Seismic Profiling (VSP) operations for nominal drilling locations, assuming different numbers of impulses during a 24 h period.

Hearing group	Threshold for SEL _{24h} (L _{E,24h} ; dB re 1 µPa ² ·s)	Distance R _{max} (km)															
		British Admiral				Flanagan				Julpha				Garfield			
		Number of impulses				Number of impulses				Number of impulses				Number of impulses			
		10	50	100	130	10	50	100	130	10	50	100	130	10	50	100	130
PTS																	
LF cetaceans	183	0.05	0.20	0.28	0.32	0.05	0.20	0.29	0.33	0.07	0.16	0.22	0.25	0.05	0.18	0.27	0.30
HF cetaceans	185	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VHF cetaceans	155	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Otariid seals	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sea turtles	204	–	–	0.03	0.03	–	–	0.03	0.03	–	–	0.02	0.03	–	–	0.02	0.03
TTS																	
LF cetaceans	168	0.47	0.99	1.35	1.47	0.48	0.97	1.31	1.50	0.37	0.70	0.92	1.00	0.50	1.50	2.07	2.39
HF cetaceans	170	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VHF cetaceans	140	0.02	0.05	0.07	0.08	0.02	0.05	0.07	0.08	–	0.05	0.07	0.09	0.02	0.05	0.06	0.07
Otariid seals	188	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sea turtles	189	0.05	0.17	0.24	0.27	0.05	0.18	0.25	0.27	0.06	0.13	0.20	0.23	0.03	0.15	0.23	0.26

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Table 39. VSP, multiple-pulse SEL: Maximum ranges to SEL_{24h} based fish criteria (Popper et al. 2014) from VSP operations, assuming different numbers of impulses during a 24 h period.

Marine fauna group	Threshold for SEL _{24h} ($L_{E,24h}$; dB re 1 $\mu\text{Pa}^2\cdot\text{s}$)	Distance R_{max} (km)															
		<i>T/49P British Admiral</i>				<i>T/49P Flanagan</i>				<i>VIC/P79 Julpha</i>				<i>VIC/P79 Garfield</i>			
		Number of impulses				Number of impulses				Number of impulses				Number of impulses			
		10	50	100	130	10	50	100	130	10	50	100	130	10	50	100	130
Mortality and potential mortal injury																	
I	219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II, fish eggs and fish larvae	210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
III	207	-	-	0.02	0.03	-	-	0.02	0.03	-	-	0.02	0.03	-	-	-	0.02
Fish recoverable injury																	
I	216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II, III	203	-	0.02	0.03	0.03	-	0.03	0.03	0.04	-	0.02	0.03	0.05	-	0.02	0.03	0.03
Fish TTS																	
I, II, III	186	0.11	0.28	0.36	0.42	0.12	0.28	0.38	0.43	0.11	0.26	0.35	0.39	0.06	0.27	0.37	0.45

Fish I–No swim bladder; Fish II–Swim bladder not involved with hearing; Fish III–Swim bladder involved with hearing. A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

4.2.4. Sound Field Maps

Maps of the estimated sound fields, threshold contours, and isopleths of interest for the VSP operations are presented for all modelled nominal sites. The per-pulse SPL sound fields are presented as contour maps in Figures 82 to 85. The SEL_{24h} sound fields are presented as contour maps in Figures 86 to 89 for 130 impulses per day. These figures present the unweighted SEL_{24h} in 10 dB steps, as well as the isopleths corresponding to thresholds or guidelines for which R_{max} is greater than 20 m, the modelling resolution.

4.2.4.1. Maximum-over-depth Per-Pulse Sound Fields

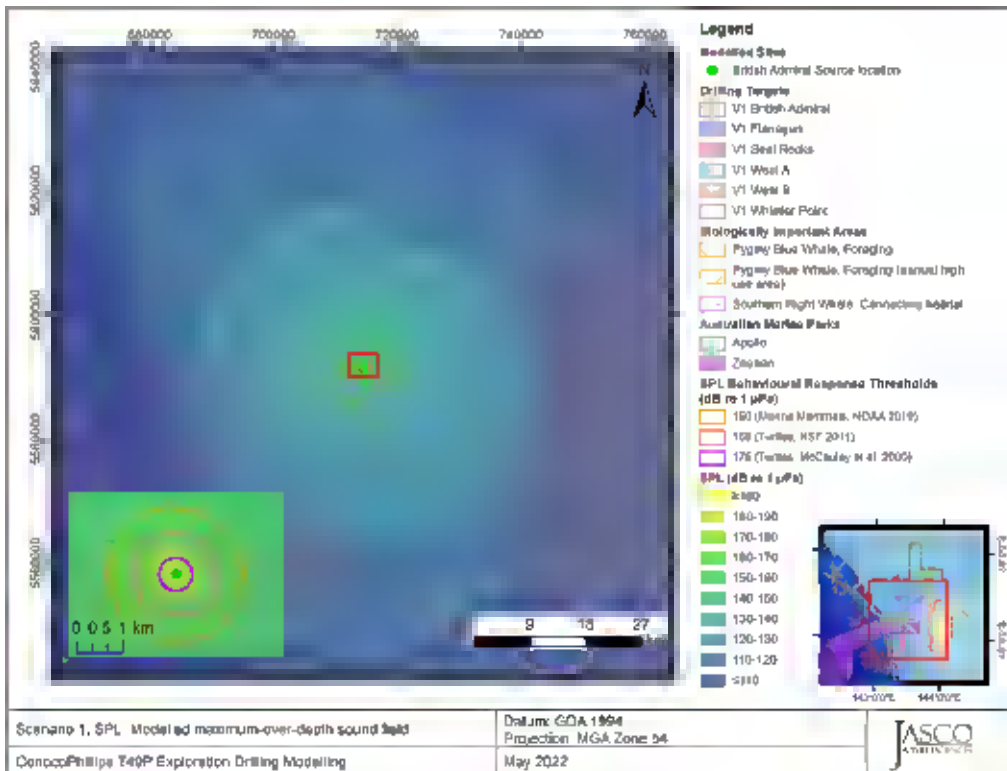


Figure 82. VSP, T/49P British Admiral, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleth of behavioural response thresholds for marine mammals and turtles.

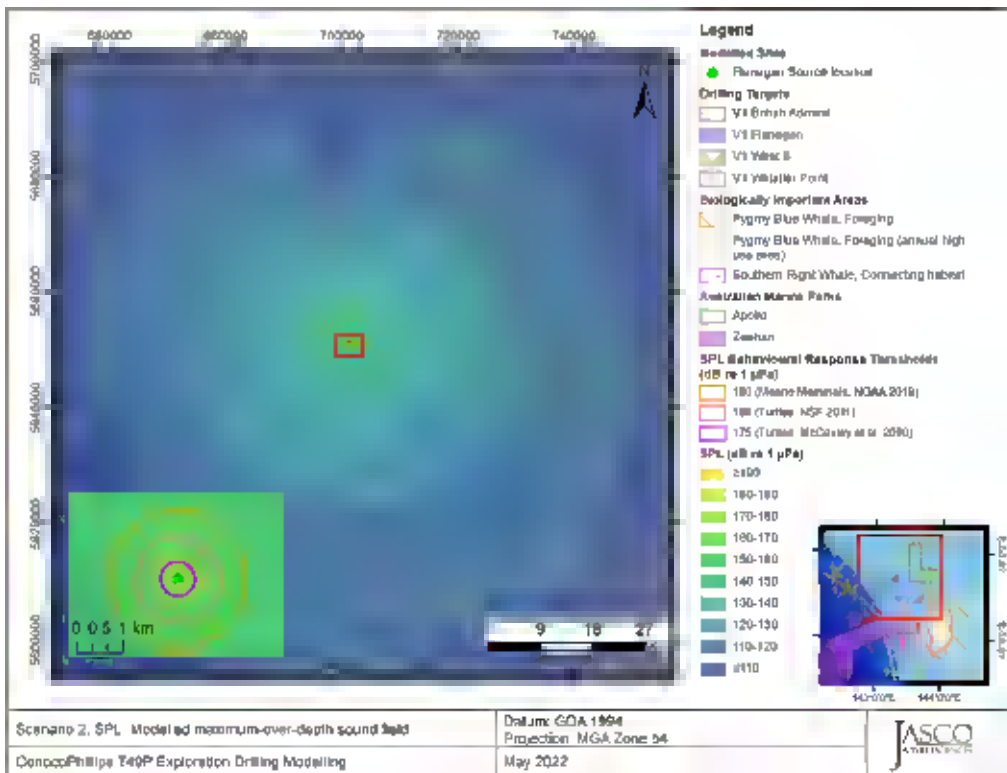


Figure 83. VSP, T/49P Flanagan, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleth of behavioural response thresholds for marine mammals and turtles.

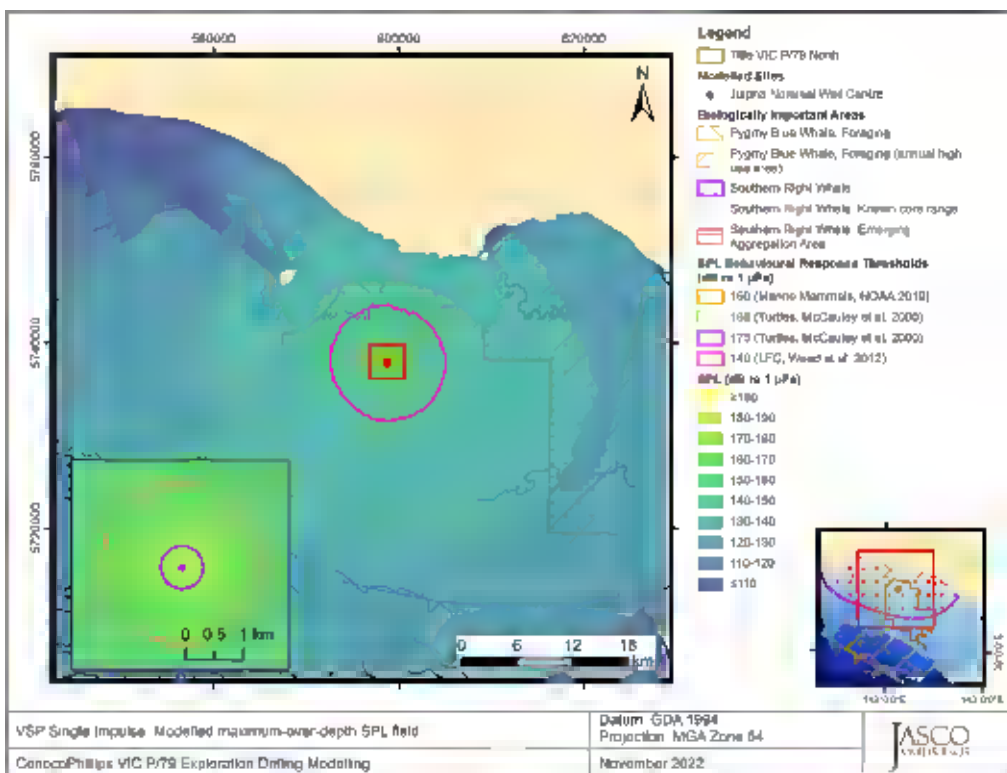


Figure 84. VSP, VIC/P79 Julpha, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleth of behavioural response thresholds for marine mammals and turtles.

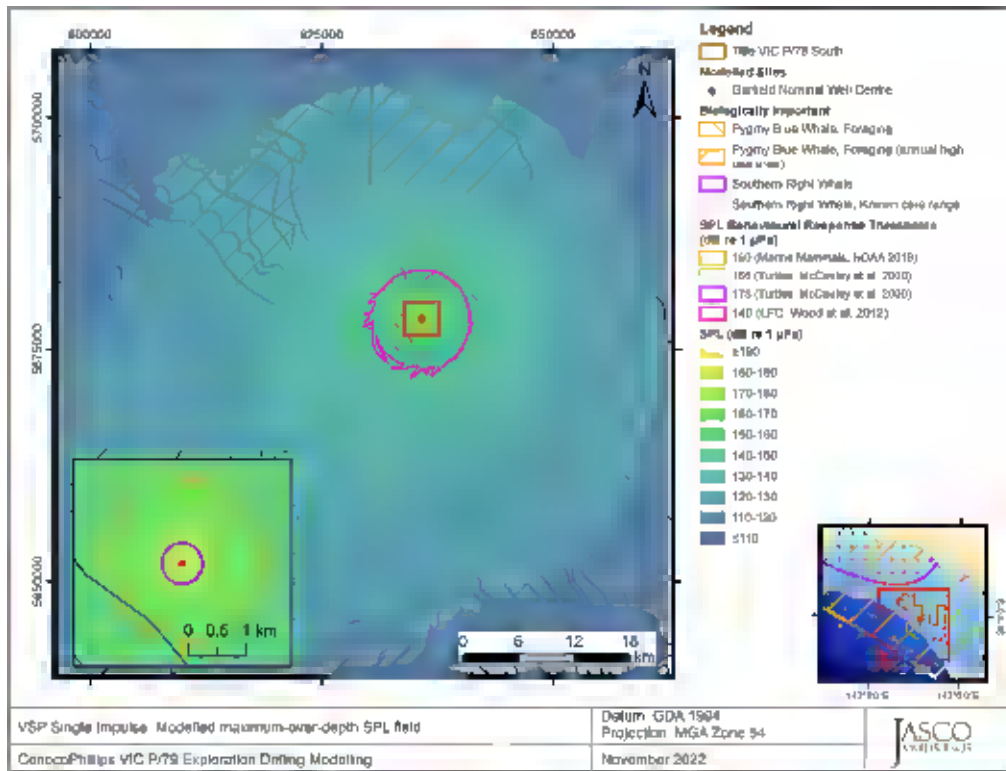


Figure 85. VSP, VIC/P79 Garfield, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleth of behavioural response thresholds for marine mammals and turtles.

4.2.4.2. Accumulated Multi-Pulse Sound Fields

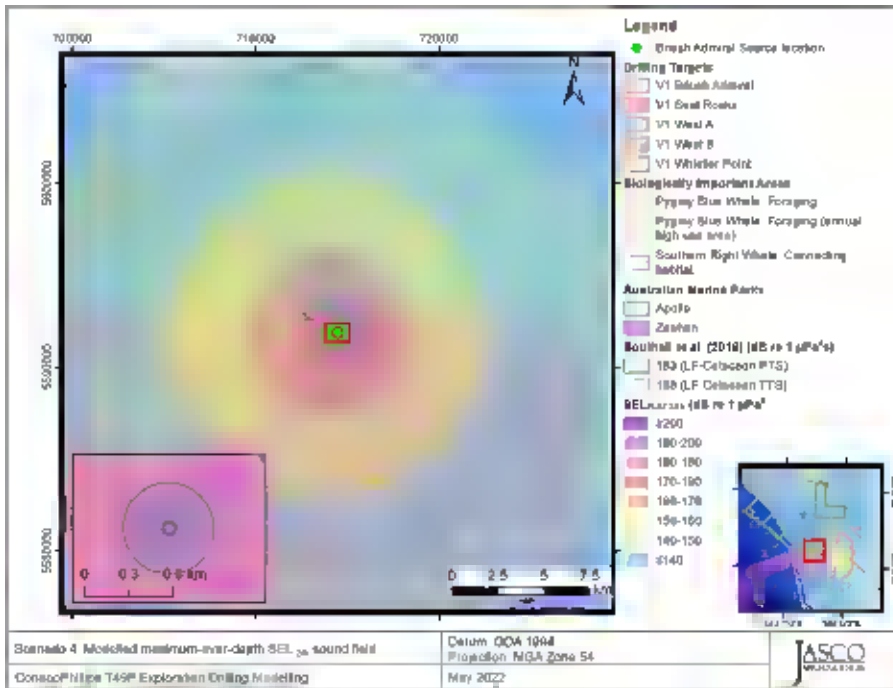


Figure 86. VSP, T/49P British Admiral, multiple-pulse SEL, 130 impulses: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.2.3 for distances.

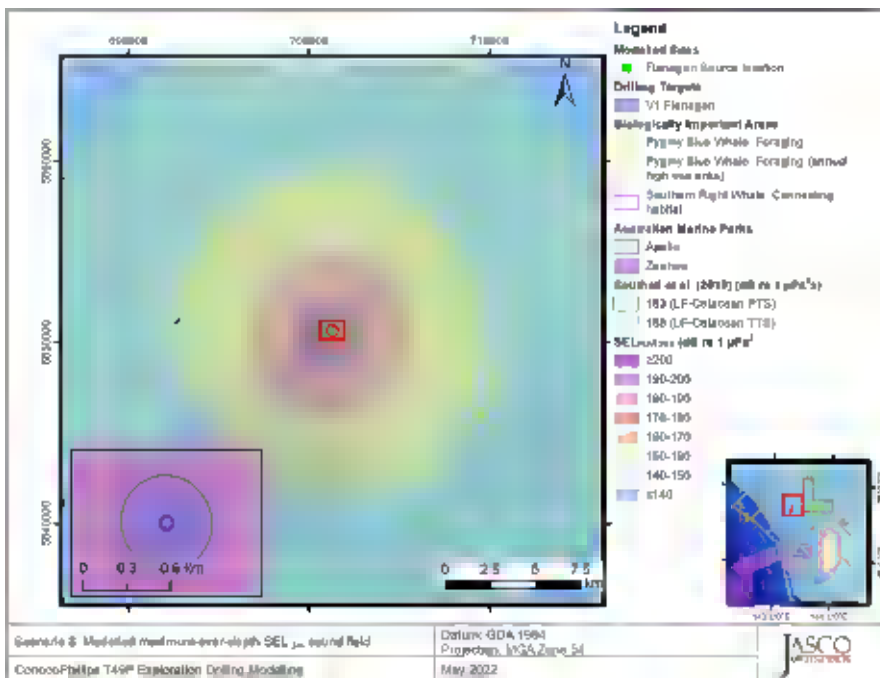


Figure 87. VSP, Flanagan, multiple-pulse SEL, 130 impulses: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.2.3 for distances.

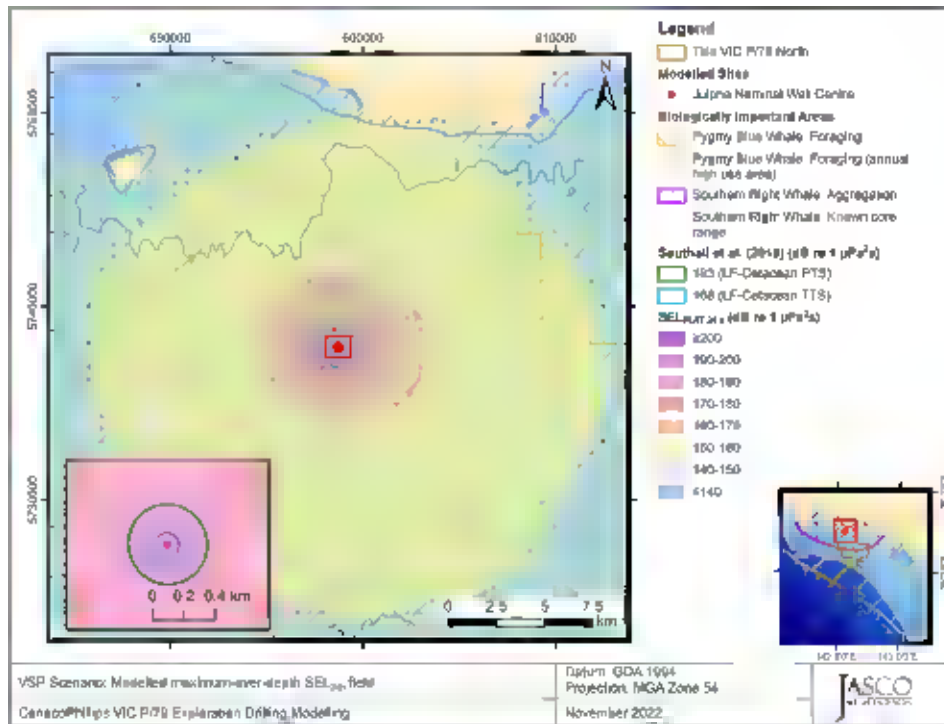


Figure 88. VSP, VIC/P78 Julpha, multiple-pulse SEL, 130 impulses: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.2.3 for distances.

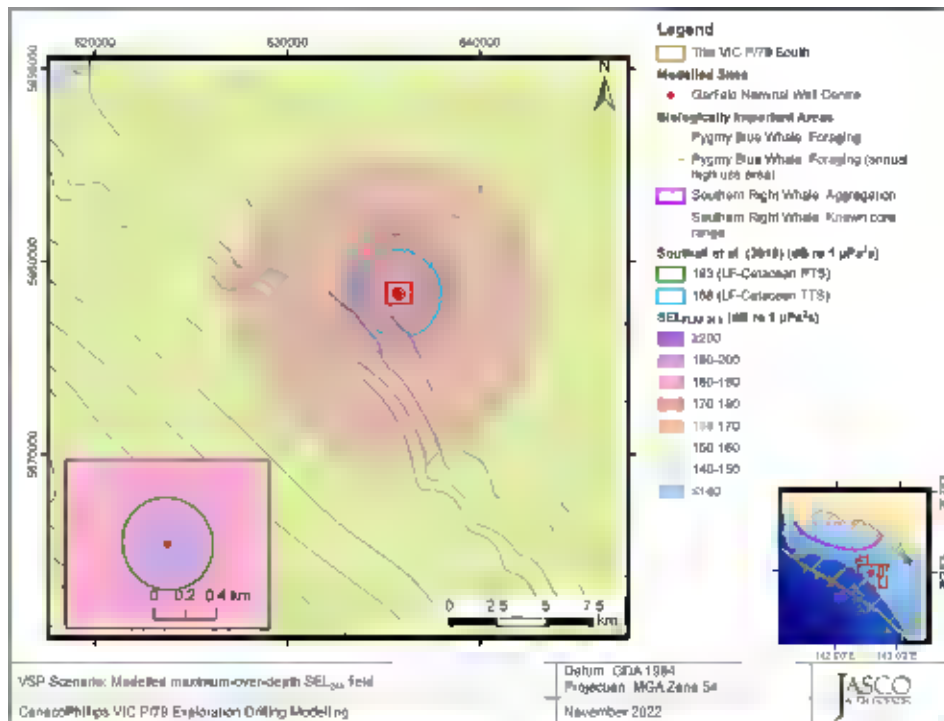


Figure 89. VSP, VIC/P79 Garfield, multiple-pulse SEL, 130 impulses: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.2.3 for distances.

4.3. Boomer Sub-bottom Profiling

4.3.1. Per-Pulse Sound Fields

This section presents the per-pulse sound fields in terms of maximum-over-depth SPL, SEL, PK, and seafloor PK and PK-PK. The different metrics are presented for the following reasons:

- Table 40) are used as inputs into the 24 h SEL scenario and to provide context for the range to 160 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$, relevant for the EPBC Act Policy Statement 2.1 (DEWHA 2008). The 160 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$ level for impulsive sources from EPBC Act Policy Statement 2.1 (DEWHA 2008) is not reached.
- SPL sound fields (Table 41) were used to determine the distances to marine mammal and turtle behavioural thresholds (see Sections 2.1 and 2.2). They were also used to determine the maximum distance to the low-frequency weighted SPL 140 dB.
- PK metrics within the water column are relevant to thresholds and guidelines for marine mammals, sea turtles, fish, fish eggs and larvae (as well as plankton; see Sections 2.1 and 2.2). However, no thresholds were exceeded within the modelling resolution of 20 m.
- PK metrics at the seafloor are relevant to guidelines for fish, fish eggs and larvae (Section 3.4). However, no thresholds were exceeded and thus no tabulated results are included.
- PK-PK metrics at the seafloor are relevant to sound levels used in assessing effect on benthic invertebrates (see Section 2.3). However, no thresholds were exceeded and thus no tabulated results are included.

The SPL sound fields, and distances to relevant isopleths can be visualised on the contour maps presented in Section 4.2.4.1.

Table 40. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the Sub-bottom Profiling (SBP) boomer to modelled maximum-over-depth unweighted per-pulse sound exposure level (SEL) isopleths for the nominal locations.

Per-pulse SEL (L_E ; dB re 1 $\mu\text{Pa}^2\cdot\text{s}$)	Julpha		Garfield	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
140	0.03	0.03	0.03	0.03
130	0.15	0.15	0.19	0.18
120	0.48	0.46	0.50	0.48
110	1.32	1.25	1.42	1.35
100	3.21	3.00	4.57	3.92

Table 41. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the Sub-bottom Profiling (SBP) boomer to modelled maximum-over-depth unweighted per-pulse sound pressure level (SPL) isopleths for the nominal locations.

SPL (L_p ; dB re 1 μPa)	Julpha		Merope	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
150	0.03	0.03	0.03	0.03
140	0.14	0.13	0.17	0.16
130	0.43	0.42	0.46	0.44
120	1.12	1.08	1.18	1.13
110	2.92	2.74	3.37	2.86

Table 42. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the Sub-bottom Profiling (SBP) boomer to modelled maximum-over-depth low-frequency cetacean weighted per-pulse sound pressure level (SPL) 140 dB isopleth for the nominal locations.

LF cetacean weighted SPL ($L_{p,LF}$; dB re 1 μ Pa)	Julpha		Merope	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
140 ^a	0.12	0.12	0.13	0.13

^a Marine mammal behavioural response threshold for a 50% probability of response for impulsive sound sources (adapted from Wood et al. (2012)).

4.3.2. Multiple Pulse Sound Fields

This section presents the sound fields in terms of SEL accumulated over 24 h of activity, for the modelled scenario (Table 11). Frequency-weighted SEL_{24h} sound fields were used to estimate the maximum and 95% distances (R_{max} and $R_{95\%}$; calculated as detailed in Appendix D.3) to marine mammal and marine turtle PTS and TTS thresholds (Table 43), and to estimate maximum distance and the area to injury and TTS guidelines for fish (Table 44).

Table 43. SBP, multiple-pulse SEL: Maximum-over-depth distances (in km) to frequency-weighted SEL_{24h} based PTS and TTS thresholds for marine mammals Southall et al. (2019) and sea turtles (Finneran et al. 2017) from Sub-bottom Profiling (SBP) operations for nominal drilling locations, assuming different numbers of impulses during a 24 h period.

Hearing group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 μ Pa ² ·s)	Julpha		Garfield	
		Distance R_{max} (km)	Ensonified Area (km ²)	Distance R_{max} (km)	Ensonified Area (km ²)
PTS					
LF cetaceans	183	–	–	–	–
HF cetaceans	185	–	–	–	–
VHF cetaceans	155	–	–	–	–
Otariid pinnipeds in water	203	–	–	–	–
Sea turtles	204	–	–	–	–
TTS					
LF cetaceans	168	–	1.01	–	1.01
HF cetaceans	170	–	–	–	–
VHF cetaceans	140	0.02	1.29	0.02	2.02
Otariid pinnipeds in water	188	–	–	–	–
Sea turtles	189	–	–	–	–

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Table 44. SBP, multiple-pulse SEL: Maximum ranges to SEL_{24h} based fish criteria (Popper et al. 2014) for the SBP 24h scenario.

Marine fauna group	Threshold for SEL _{24h} ($L_{E,24h}$; dB re 1 $\mu\text{Pa}^2\cdot\text{s}$)	Julpha	Garfield
		Distance R_{max} (km)	Distance R_{max} (km)
Mortality and potential mortal injury			
I	219	–	–
II, fish eggs and fish larvae	210	–	–
III	207	–	–
Fish recoverable injury			
I	216	–	–
II, III	203	–	–
Fish TTS			
I, II, III	186	–	–

Fish I–No swim bladder; Fish II–Swim bladder not involved with hearing; Fish III–Swim bladder involved with hearing. A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

4.3.3. Sound Field Maps

Maps of the estimated sound fields, threshold contours, and isopleths of interest for the SBP operations are presented for the Julpha site. The per-pulse SPL sound fields for the nominal drill locations are presented as contour maps in Figure 90 and Figure 91. The SEL_{24h} sound fields are presented as contour maps in Figure 92 and Figure 93. These figures presents the unweighted SEL_{24h} in 10 dB steps, as well as the isopleths corresponding to thresholds or guidelines for which R_{max} is greater than 20 m, the modelling resolution.

4.3.3.1. Maximum-over-depth Per-Pulse Sound Fields

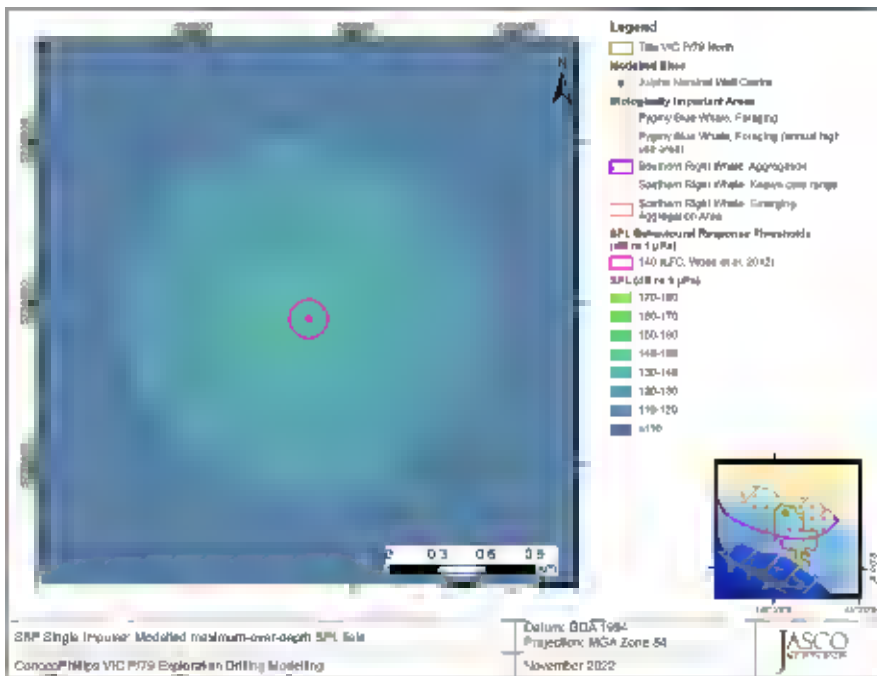


Figure 90. SBP, VIC/P79 Julpha, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleth of behavioural response thresholds for marine mammals and turtles.

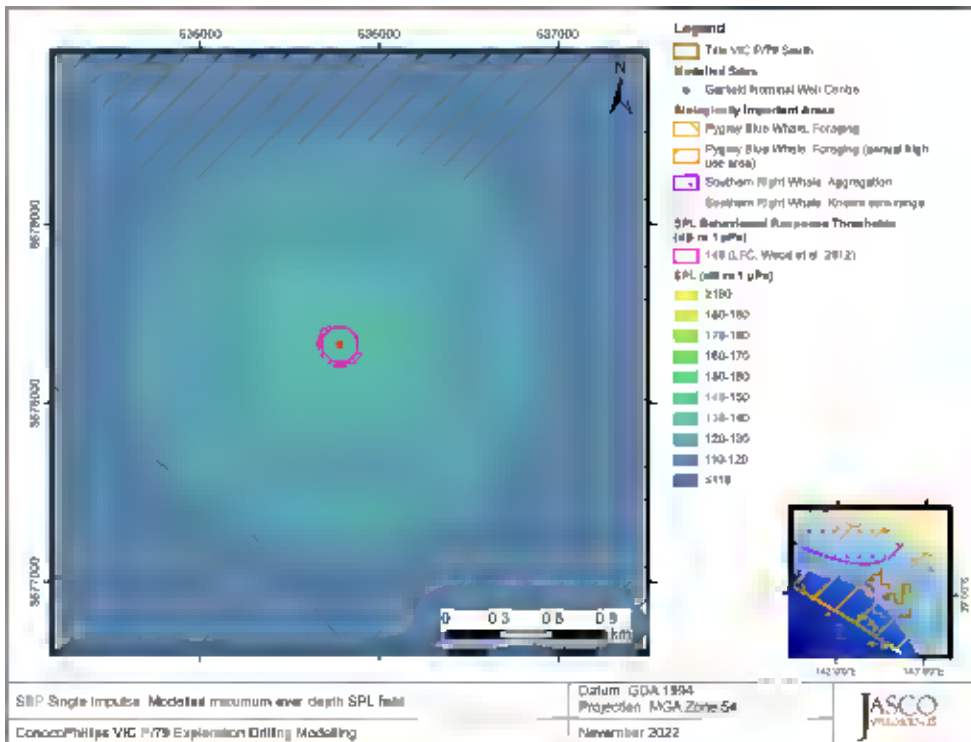


Figure 91. SBP, VIC/P79 Garfield, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleth of behavioural response thresholds for marine mammals and turtles.

4.3.3.2. Accumulated Multi-Pulse Sound Fields

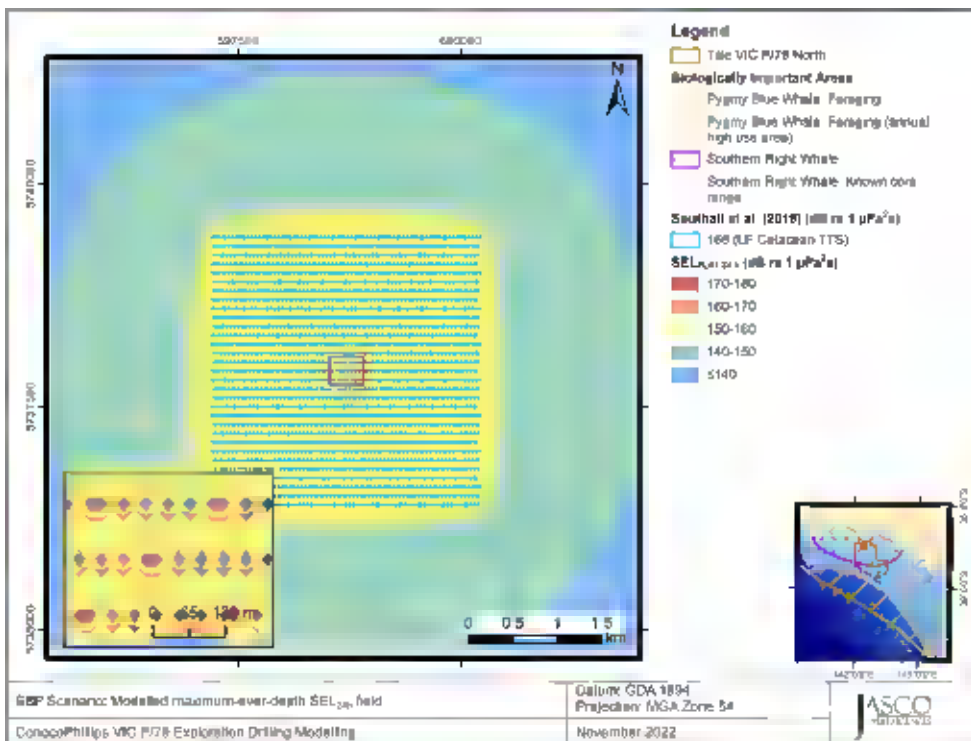


Figure 92. SBP, VIC/P79 Julpha, multiple-pulse SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.2.3 for distances.

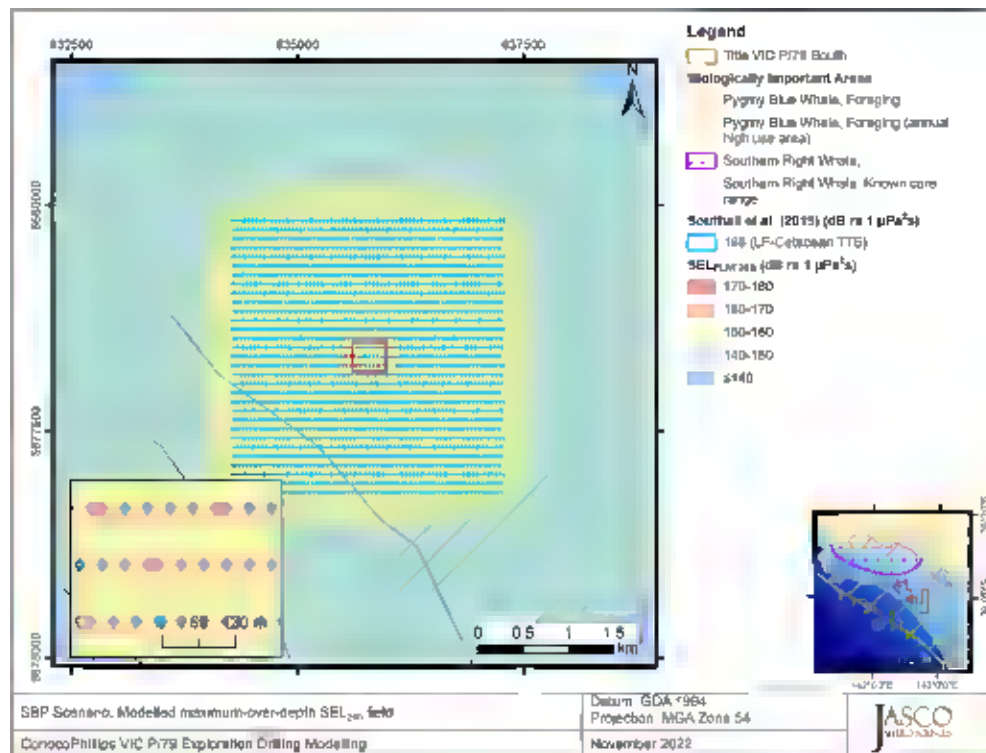


Figure 93. SBP, VIC/P79 Garfield, multiple-pulse SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with isopleths for temporary threshold shift (TTS) thresholds. Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 4.2.3 for distances.

5. Discussion and Conclusion

This modelling study presented underwater sound levels associated with the Otway Exploration Drilling Program. Sound fields were modelled for non-impulsive vessel and drilling noise sources, as well as an impulsive source (VSP and SBP). The model accounted for characteristics of each source (see Sections 3.1 and 3.2), as well as localised bathymetric variation, geoacoustic parameters, and sound speed variation throughout the water column (see Appendix D.2).

Both the MODU and AHTS were modelled as omnidirectional sources, and the VSP source showed little variation in directionality (see Appendix B.3), hence the shapes of the noise footprints for each modelled scenario are nearly entirely down to environmental features.

The studied modelling locations, with the exception of Garfield West, are on the continental shelf, and variations in bathymetry close to the source are gradual, resulting in broadly symmetric sound fields. The proximity of Garfield West to the continental slope, combined with its more reflective seabed resulted in increased ranges to SPL thresholds compared to similar scenarios modelled at sites further inshore.

The sound speed profile (see Appendix D.2.2) was derived from data from the US Naval Oceanographic Office's Generalized Digital Environmental Model V 3.0 (GDEM; Teague et al. 1990, Carnes 2009). The month of July was chosen based on an analysis of the temperature, salinity and sound speed profiles extracted from this database. The final sound speed profile consisted of a composite profile representative of the environmental conditions likely to occur within the modelled area to capture propagation effects associated with shallow and deep-water regimes.

In T/49P, the sound speed profile was primarily downwards refracting, down to 1000 m depth, apart from a moderate surface duct. This surface duct traps high-frequency energy near the sea surface that would otherwise dissipate more rapidly in range due to seabed losses. However, at only approximately 40 m deep, this duct is not deep enough to trap energy below approximately 550 Hz. For all the modelled sources, most sound energy propagates at frequencies lower than this. However, there is enough sound energy at high frequency that, when trapped, can propagate with little loss and can produce higher levels near the sea-surface than scenarios where no surface duct is present.

In the northern extent of VIC/P79, the sound speed profile was primarily downwards refracting down to 1000 m depth, however this only influences the sound fields at ranges well beyond those associated with the effect thresholds being considered. The sound fields closer to the sources, and thus in depths less than 200 m, experience a generally linear sound speed profile.

In the southern extent of VIC/P79, the sound speed profile was primarily downwards refracting down to 1200 m depth, where it becomes upwards refracting. This downward refraction reduces propagation for any region with a depth less than 1200 m through sea-bed absorption, reducing distances to thresholds for the Essington and Garfield Sites. However, the sound emitted from the Garfield West Site in the offshore direction reaches this upward refracting layer, and experiences increased propagation as seen in the maps.

For the results tables presented in Section 4, where a dash is used in place of a horizontal distance, these thresholds may or may not be reached. Due to the discretely sampled 20 m calculation grids of the modelled sound fields, distances to these levels could not be estimated for practicable computational purposes. It is likely that SPL isopleths could be reached at distances between the source and the modelled horizontal resolution (20 m); however, distances to injurious accumulated SEL thresholds may not be reached at any range greater than the source due to the species-specific frequency weighing functions. Additionally, if close-to-source radii are comparable to the dimensions of the modelled vessel (MODU or AHTS) then they may only be reached within close proximity to a vessel, if at all.

Additionally, SEL_{24h} is a cumulative metric that reflects the dosimetric impact of noise levels within 24 h based on the assumption that an animal is consistently exposed to such noise levels at a fixed position. The corresponding SEL_{24h} radii therefore represent a worst-case scenario. More realistically, marine mammals (as well as fish and turtles) would not stay in the same location for 24 h. Therefore, a reported radius for SEL_{24h} criteria does not mean that marine fauna travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with impairment if it remained in that location for 24 h.

Key findings from the study include:

- In T/49P: In general, the results are similar at all modelled locations, for the vessels and for the VSP operations. The differences between British Admiral and British Admiral West are relatively minor and considered for only two scenarios to provide a comparison point. The differences are shown in Table 45, and demonstrate the influence of the proximity of the shelf edge to British Admiral West. Additional analysis of the modelling work presented in this report for T/49P has been conducted (Appendix F) that indicates that it would be reasonable to represent the potential ranges to effect for drilling and associated operations within approximately the 110–125 m contour through using the presented results. Therefore, all potential drilling locations in T/49P within the operational area except for the very offshore boundary of Seal Rocks in two locations (near the canyon heads), can be represented through the presented results.
- In the northern extent of VIC/P79: Despite the 20 m depth difference, or approximately a 30% difference in these shallow water depths, and similar geology between sites, there is only minor variations in the ranges to thresholds for the vessel related activities at sites.
- In the southern extent of VIC/P79: Despite the 17 m (18%) depth difference between Essington and Garfield, and Garfield's placement approximately 10 km closer to the shelf edge and similar geology between the two sites, the variations observed in the ranges to thresholds for the vessel related activities at both sites are minimal. While the proximity to the shelf edge does not greatly affect the results of these inshore sites, Garfield West, located effectively on the shelf edge, clearly demonstrates the extended ranges to threshold expected in the offshore direction. Additionally, Garfield West has a highly reflective seabed geology, contributing to its favourable propagation conditions. The reason this extended propagation is not observed in the near shelf sites is due to the combination of sources and the source depths used in the modelling, the almost linear sound speed profile in the top 200 m and the attenuating influence of the calcarenite seafloor.

Table 45. Comparison I between the results in Table 20 for British Admiral compared to British Admiral West (positive values indicate the range is further at British Admiral, negative the range is further at British Admiral West).

British Admiral compared to British Admiral West				
SPL (L_p ; dB re 1 μ Pa)	Scenario 3: MODU		Scenario 4: MODU+Supply vessel	
	ΔR_{max} (km)	$\Delta R_{95\%}$ (km)	ΔR_{max} (km)	$\Delta R_{95\%}$ (km)
170 ^a	-	-	0	0
160	0.02	0.02	0	0
158 ^b	0.02	0.02	0.03	0.02
150	0	0	0.02	0.02
140	0	0	0	-0.01
130	-0.01	-0.01	-0.04	-0.05
120 ^c	-0.07	0.05	-0.4	-0.1
110	0.21	0.11	-2	-2.5

Glossary

Unless otherwise stated in an entry, these definitions are consistent with ISO 80000-3 (2017).

1/3-octave

One third of an octave. *Note:* A one-third octave is approximately equal to one decidecade ($1/3 \text{ oct} \approx 1.003 \text{ ddec}$).

1/3-octave-band

Frequency band whose bandwidth is one one-third octave. *Note:* The bandwidth of a one-third octave-band increases with increasing centre frequency.

90%-energy time window

The time interval over which the cumulative energy rises from 5 to 95% of the total pulse energy. This interval contains 90% of the total pulse energy. Symbol: T_{90} .

90% sound pressure level (90% SPL)

The sound pressure level calculated over the 90%-energy time window of a pulse.

acoustic impedance

The ratio of the sound pressure in a medium to the volume flow rate of the medium through a specified surface due to the sound wave.

acoustic noise

Sound that interferes with an acoustic process.

ambient sound

Sound that would be present in the absence of a specified activity, usually a composite of sound from many sources near and far, e.g., shipping vessels, seismic activity, precipitation, sea ice movement, wave action, and biological activity.

attenuation

The gradual loss of acoustic energy from absorption and scattering as sound propagates through a medium.

audiogram

A graph or table of hearing threshold as a function of frequency that describes the hearing sensitivity of an animal over its hearing range.

auditory frequency weighting

The process of applying an auditory frequency weighting function. In human audiometry, C-weighting is the most commonly used function, an example for marine mammals are the auditory frequency weighting functions published by Southall et al. (2007).

auditory frequency weighting function

Frequency weighting function describing a compensatory approach accounting for a species' (or functional hearing group's) frequency-specific hearing sensitivity. Example hearing groups are low-, mid-, and high-frequency cetaceans, phocid and otariid pinnipeds.

azimuth

A horizontal angle relative to a reference direction, which is often magnetic north or the direction of travel. In navigation it is also called bearing.

background noise

Combination of ambient sound, acoustic self-noise, and sonar reverberation. Ambient sound detected, measured, or recorded with a signal is part of the background noise.

bandwidth

The range of frequencies over which a sound occurs. Broadband refers to a source that produces sound over a broad range of frequencies (e.g., seismic airguns, vessels) whereas narrowband sources produce sounds over a narrow frequency range (e.g., sonar) (ANSI S1.13-2005 (R2010)).

bar

Unit of pressure equal to 100 kPa, which is approximately equal to the atmospheric pressure on Earth at sea level. 1 bar is equal to 10^5 Pa or 10^{11} μ Pa.

boxcar averaging

A signal smoothing technique that returns the averages of consecutive segments of a specified width.

broadband level

The total level measured over a specified frequency range.

cavitation

A rapid formation and collapse of vapor cavities (i.e., bubbles or voids) in water, most often caused by a rapid change in pressure. Fast-spinning vessel propellers typically cause cavitation, which creates a lot of noise.

cetacean

Any animal in the order Cetacea. These are aquatic species and include whales, dolphins, and porpoises.

compressional wave

A mechanical vibration wave in which the direction of particle motion is parallel to the direction of propagation. Also called primary wave or P-wave.

conductivity-temperature-depth (CTD)

Measurement data of the ocean's conductivity, temperature, and depth; used to compute sound speed and salinity.

continuous sound

A sound whose sound pressure level remains above ambient sound during the observation period. A sound that gradually varies in intensity with time, for example, sound from a marine vessel.

decade

Logarithmic frequency interval whose upper bound is ten times larger than its lower bound (ISO 80000-3:2006).

decidecade

One tenth of a decade. *Note:* An alternative name for decidecade (symbol ddec) is “one-tenth decade”. A decidecade is approximately equal to one third of an octave (1 ddec \approx 0.3322 oct) and for this reason is sometimes referred to as a “one-third octave”.

decidecade band

Frequency band whose bandwidth is one decidecade. *Note:* The bandwidth of a decidecade band increases with increasing centre frequency.

decibel (dB)

Unit of level used to express the ratio of one value of a power quantity to another on a logarithmic scale. Unit: dB.

energy source level

A property of a sound source obtained by adding to the sound exposure level measured in the far field the propagation loss from the acoustic centre of the source to the receiver position. Unit: decibel (dB). Reference value: 1 $\mu\text{Pa}^2\text{m}^2\text{s}$.

energy spectral density

Ratio of energy (time-integrated square of a specified field variable) to bandwidth in a specified frequency band f_1 to f_2 . In equation form, the energy spectral density E_f is given by:

$$E_f = \frac{2 \int_{f_1}^{f_2} |X(f)|^2 df}{f_2 - f_1},$$

where $X(f)$ is the Fourier transform of the field variable $x(t)$

$$X(f) = \int_{-\infty}^{+\infty} x(t) \exp(-2\pi i f t) dt .$$

The field variable $x(t)$ is a scalar quantity, such as sound pressure. It can also be the magnitude or a specified component of a vector quantity such as sound particle displacement, sound particle velocity, or sound particle acceleration. The unit of energy spectral density depends on the nature of x , as follows:

- If x = sound pressure: $\text{Pa}^2 \text{ s/Hz}$
- If x = sound particle displacement: $\text{m}^2 \text{ s/Hz}$
- If x = sound particle velocity: $(\text{m/s})^2 \text{ s/Hz}$
- If x = sound particle acceleration: $(\text{m/s}^2)^2 \text{ s/Hz}$

The factor of two on the right-hand side of the equation for E_f is needed to express a spectrum that is symmetric about $f = 0$, in terms of positive frequencies only. See entry 3.1.3.9 of ISO 18405 (2017).

energy spectral density level

The level ($L_{E,f}$) of the **energy spectral density** (E_f). Unit: decibel (dB).

$$L_{E,f} := 10 \log_{10} (E_f / E_{f,0}) \text{ dB} .$$

The frequency band and integration time should be specified.

As with **energy spectral density**, energy spectral density level can be expressed in terms of various field variables (e.g., sound pressure, sound particle displacement). The reference value ($E_{f,0}$) for energy spectral density level depends on the nature of field variable.

energy spectral density source level

A property of a sound source obtained by adding to the energy spectral density level of the sound pressure measured in the far field the propagation loss from the acoustic centre of the source to the receiver position. Unit: decibel (dB). Reference value: $1 \mu\text{Pa}^2\text{m}^2\text{s}/\text{Hz}$.

ensonified

Exposed to sound.

far field

The zone where, to an observer, sound originating from an array of sources (or a spatially distributed source) appears to radiate from a single point.

Fourier transform (or Fourier synthesis)

A mathematical technique which, although it has varied applications, is referenced in the context of this report as a method used in the process of deriving a spectrum estimate from time-series data (or the reverse process, termed the inverse Fourier transform). A computationally efficient numerical algorithm for computing the Fourier transform is known as fast Fourier transform (FFT).

flat weighting

Term indicating that no frequency weighting function is applied. Synonymous with unweighted.

frequency

The rate of oscillation of a periodic function measured in cycles-per-unit-time. The reciprocal of the period. Unit: hertz (Hz). Symbol: f . 1 Hz is equal to 1 cycle per second.

frequency weighting

The process of applying a frequency weighting function.

frequency-weighting function

The squared magnitude of the sound pressure transfer function. For sound of a given frequency, the frequency weighting function is the ratio of output power to input power of a specified filter, sometimes expressed in decibels. Examples include the following:

- *Auditory frequency weighting function*: compensatory frequency weighting function accounting for a species' (or functional hearing group's) frequency-specific hearing sensitivity.
- *System frequency weighting function*: frequency weighting function describing the sensitivity of an acoustic acquisition system, typically consisting of a hydrophone, one or more amplifiers, and an analogue to digital converter.

geoacoustic

Relating to the acoustic properties of the seabed.

hearing group

Category of animal species when classified according to their hearing sensitivity and to the susceptibility to sound. Examples for marine mammals include very low-frequency (VLF) cetaceans, low-frequency (LF) cetaceans, mid-frequency (MF) cetaceans, high-frequency (HF) cetaceans, very high-frequency (VHF) cetaceans, otariid pinnipeds in water (OPW), phocid pinnipeds in water (PPW), sirenians (SI), other marine carnivores in air (OCA), and other marine carnivores in water (OCW) (NMFS 2018, Southall et al. 2019). See **auditory frequency weighting functions**, which are often applied to these groups. Examples for fish include species for which the swim bladder is involved in

hearing, species for which the swim bladder is not involved in hearing, and species without a swim bladder (Popper et al. 2014).

hearing threshold

The sound pressure level for any frequency of the hearing group that is barely audible for a given individual for specified background noise during a specific percentage of experimental trials.

hertz (Hz)

A unit of frequency defined as one cycle per second.

high-frequency (HF) cetacean

See **hearing group**.

impulsive sound

Qualitative term meaning sounds that are typically transient, brief (less than 1 second), broadband, with rapid rise time and rapid decay. They can occur in repetition or as a single event. Examples of impulsive sound sources include explosives, seismic airguns, and impact pile drivers.

isopleth

A line drawn on a map through all points having the same value of some quantity.

knot

One nautical mile per hour. Symbol: kn.

level

A measure of a quantity expressed as the logarithm of the ratio of the quantity to a specified reference value of that quantity. Examples include sound pressure level, sound exposure level, and peak sound pressure level. For example, a value of sound exposure level with reference to $1 \mu\text{Pa}^2 \text{ s}$ can be written in the form $\times \text{ dB re } 1 \mu\text{Pa}^2 \text{ s}$.

low-frequency (LF) cetacean

See **hearing group**.

median

The 50th percentile of a statistical distribution.

mid-frequency (MF) cetacean

See **hearing group**.

monopole source level (MSL)

A source level that has been calculated using an acoustic model that accounts for the effect of the sea-surface and seabed on sound propagation, assuming a point-like (monopole) sound source. Also see **radiated noise level**.

Monte Carlo simulation

The method of investigating the distribution of a non-linear multi-variate function by random sampling of all of its input variable distributions.

M-weighting

See **auditory frequency weighting function** (as proposed by Southall et al. 2007).

mysticete

A suborder of cetaceans that use baleen plates to filter food from water. Members of this group include rorquals (Balaenopteridae), right whales (Balaenidae), and grey whales (*Eschrichtius robustus*).

N percent exceedance level

The sound level exceeded *N*% of the time during a specified time interval. Also see **percentile level**.

non-impulsive sound

Sound that is not an impulsive sound. A non-impulsive sound is not necessarily a continuous sound.

octave

The interval between a sound and another sound with double or half the frequency. For example, one octave above 200 Hz is 400 Hz, and one octave below 200 Hz is 100 Hz.

odontocete

The presence of teeth, rather than baleen, characterizes these whales. Members of the Odontoceti are a suborder of cetaceans, a group comprised of whales, dolphins, and porpoises. The skulls of toothed whales are mostly asymmetric, an adaptation for their echolocation. This group includes sperm whales, killer whales, belugas, narwhals, dolphins, and porpoises.

otariid

A common term used to describe members of the Otariidae, eared seals, commonly called sea lions and fur seals. Otariids are adapted to a semi-aquatic life; they use their large fore flippers for propulsion. Their ears distinguish them from phocids. Otariids are one of the three main groups in the superfamily Pinnipedia; the other two groups are phocids and walrus.

otariid pinnipeds in water (OPW)

See **hearing group**.

other marine carnivores in water (OCW)

See **hearing group**.

parabolic equation method

A computationally efficient solution to the acoustic wave equation that is used to model propagation loss. The parabolic equation approximation omits effects of back-scattered sound, simplifying the computation of propagation loss. The effect of back-scattered sound is negligible for most ocean-acoustic propagation problems.

peak sound pressure level (zero-to-peak sound pressure level)

The level ($L_{p,pk}$ or L_{pk}) of the squared maximum magnitude of the sound pressure (p_{pk}^2).

Unit: decibel (dB). Reference value (p_0^2) for sound in water: $1 \mu\text{Pa}^2$.

$$L_{p,pk} = 10 \log_{10}(p_{pk}^2/p_0^2) \text{ dB} = 20 \log_{10}(p_{pk}/p_0) \text{ dB}$$

The frequency band and time window should be specified. Abbreviation: PK or Lpk.

peak-to-peak sound pressure

The difference between the maximum and minimum sound pressure over a specified frequency band and time window. Unit: pascal (Pa).

percentile level

The sound level not exceeded $N\%$ of the time during a specified time interval. The N th percentile level is equal to the $(100-N)\%$ exceedance level. Also see **N percent exceedance level**.

permanent threshold shift (PTS)

An irreversible loss of hearing sensitivity caused by excessive noise exposure. PTS is considered auditory injury.

phocid

A common term used to describe all members of the family Phocidae. These true/earless seals are more adapted to in-water life than are otariids, which have more terrestrial adaptations. Phocids use their hind flippers to propel themselves. Phocids are one of the three main groups in the superfamily Pinnipedia; the other two groups are otariids and walrus.

phocid pinnipeds in water (PPW)

See **hearing group**.

pinniped

A common term used to describe all three groups that form the superfamily Pinnipedia: phocids (true seals or earless seals), otariids (eared seals or fur seals and sea lions), and walrus.

point source

A source that radiates sound as if from a single point.

power spectral density

Generic term, formally defined as power in a unit frequency band. Unit: watt per hertz (W/Hz). The term is sometimes loosely used to refer to the spectral density of other parameters such as squared sound pressure. ratio of **energy spectral density**, E_f , to time duration, Δt , in a specified temporal observation window. In equation form, the power spectral density P_f is given by:

$$P_f = \frac{E_f}{\Delta t}.$$

Power spectral density can be expressed in terms of various field variables (e.g., sound pressure, sound particle displacement).

power spectral density level

The level ($L_{p,f}$) of the **power spectral density** (P_f). Unit: decibel (dB).

$$L_{p,f} := 10 \log_{10}(P_f/P_{f,0}) \text{ dB}.$$

The frequency band and integration time should be specified.

As with **power spectral density**, power spectral density level can be expressed in terms of various field variables (e.g., sound pressure, sound particle displacement). The reference value ($P_{f,0}$) for power spectral density level depends on the nature of field variable.

power spectral density source level

A property of a sound source obtained by adding to the power spectral density level of the sound pressure measured in the far field the propagation loss from the acoustic centre of the source to the receiver position. Unit: decibel (dB). Reference value: $1 \mu\text{Pa}^2\text{m}^2/\text{Hz}$.

pressure, acoustic

The deviation from the ambient pressure caused by a sound wave. Also called sound pressure. Unit: pascal (Pa).

pressure, hydrostatic

The pressure at any given depth in a static liquid that is the result of the weight of the liquid acting on a unit area at that depth, plus any pressure acting on the surface of the liquid. Unit: pascal (Pa).

propagation loss (PL)

Difference between a source level (SL) and the level at a specified location, $PL(x) = SL - L(x)$. Also see **transmission loss**.

radiated noise level (RNL)

A source level that has been calculated assuming sound pressure decays geometrically with distance from the source, with no influence of the sea-surface and seabed. Also see **monopole source level**.

received level

The level measured (or that would be measured) at a defined location. The type of level should be specified.

reference values

standard underwater reference values used for calculating sound **levels**, e.g., the reference value for expressing sound pressure level in decibels is $1 \mu\text{Pa}$.

Quantity	Reference value
Sound pressure	$1 \mu\text{Pa}$
Sound exposure	$1 \mu\text{Pa}^2 \text{ s}$
Sound particle displacement	1 pm
Sound particle velocity	1 nm/s
Sound particle acceleration	$1 \mu\text{m/s}^2$

rms

abbreviation for root-mean-square.

shear wave

A mechanical vibration wave in which the direction of particle motion is perpendicular to the direction of propagation. Also called a secondary wave or S-wave. Shear waves propagate only in solid media, such as sediments or rock. Shear waves in the seabed can be converted to compressional waves in water at the water-seabed interface.

sound

A time-varying disturbance in the pressure, stress, or material displacement of a medium propagated by local compression and expansion of the medium.

sound exposure

Time integral of squared sound pressure over a stated time interval. The time interval can be a specified time duration (e.g., 24 h) or from start to end of a specified event (e.g., a pile strike, an airgun pulse, a construction operation). Unit: Pa² s.

sound exposure level

The level (L_E) of the sound exposure (E). Unit: decibel (dB). Reference value (E_0) for sound in water: 1 μPa² s.

$$L_E := 10 \log_{10}(E/E_0) \text{ dB} = 20 \log_{10}(E^{1/2}/E_0^{1/2}) \text{ dB}$$

The frequency band and integration time should be specified. Abbreviation: SEL.

sound exposure spectral density

Distribution as a function of frequency of the time-integrated squared sound pressure per unit bandwidth of a sound having a continuous spectrum. Unit: Pa² s/Hz.

sound field

Region containing sound waves.

sound intensity

Product of the sound pressure and the sound particle velocity. The magnitude of the sound intensity is the sound energy flowing through a unit area perpendicular to the direction of propagation per unit time.

sound pressure

The contribution to total pressure caused by the action of sound.

sound pressure level (rms sound pressure level)

The level ($L_{p,rms}$) of the time-mean-square sound pressure (p_{rms}^2). Unit: decibel (dB). Reference value (p_0^2) for sound in water: 1 μPa².

$$L_{p,rms} := 10 \log_{10}(p_{rms}^2/p_0^2) \text{ dB} = 20 \log_{10}(p_{rms}/p_0) \text{ dB}$$

The frequency band and averaging time should be specified. Abbreviation: SPL or Lrms.

sound speed profile

The speed of sound in the water column as a function of depth below the water surface.

soundscape

The characterization of the ambient sound in terms of its spatial, temporal, and frequency attributes, and the types of sources contributing to the sound field.

source level (SL)

A property of a sound source obtained by adding to the sound pressure level measured in the far field the propagation loss from the acoustic centre of the source to the receiver position. Unit: decibel (dB). Reference value: 1 μPa²m².

spectrogram

A visual representation of acoustic amplitude compared with time and frequency.

spectrum

An acoustic signal represented in terms of its power, energy, mean-square sound pressure, or sound exposure distribution with frequency.

surface duct

The upper portion of a water column within which the sound speed profile gradient causes sound to refract upward and therefore reflect off the surface resulting in relatively long-range sound propagation with little loss.

temporary threshold shift (TTS)

Reversible loss of hearing sensitivity. TTS can be caused by noise exposure.

thermocline

The depth interval near the ocean surface that experiences temperature gradients due to warming or cooling by heat conduction from the atmosphere and by warming from solar heating.

transmission loss (TL)

The difference between a specified level at one location and that at a different location, $TL(x1,x2) = L(x1) - L(x2)$. Also see **propagation loss**.

unweighted

Term indicating that no frequency weighting function is applied. Synonymous with flat weighting.

very high-frequency (VHF) cetacean

See **hearing group**.

very low-frequency (VLF) cetacean

See **hearing group**.

wavelength

Distance over which a wave completes one cycle of oscillation. Unit: metre (m). Symbol: λ .

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Appendix A. Acoustic Metrics

This section describes in detail the acoustic metrics, impact criteria, and frequency weighting relevant to the modelling study.

A.1. Pressure Related Acoustic Metrics

Underwater sound pressure amplitude is measured in decibels (dB) relative to a fixed reference pressure of $p_0 = 1 \mu\text{Pa}$. Because the perceived loudness of sound, especially pulsed sound such as from seismic airguns, pile driving, and sonar, is not generally proportional to the instantaneous acoustic pressure, several sound level metrics are commonly used to evaluate sound and its effects on marine life. Here we provide specific definitions of relevant metrics used in the accompanying report. Where possible, we follow International Organization for Standardization definitions and symbols for sound metrics (e.g., ISO 2017, ANSI S1.1-2013).

The sound pressure level (SPL or L_p ; dB re $1 \mu\text{Pa}$) is the root-mean-square (rms) pressure level in a stated frequency band over a specified time window (T ; s). It is important to note that SPL always refers to an rms pressure level and therefore not instantaneous pressure:

$$L_p = 10 \log_{10} \left(\frac{1}{T} \int_T g(t) p^2(t) dt / p_0^2 \right) \text{ dB} \quad (\text{A-1})$$

where $g(t)$ is an optional time weighting function. In many cases, the start time of the integration is marched forward in small time steps to produce a time-varying SPL function.

The sound exposure level (SEL or L_E ; dB re $1 \mu\text{Pa}^2\text{-s}$) is the time-integral of the squared acoustic pressure over a duration (T):

$$L_E = 10 \log_{10} \left(\int_T p^2(t) dt / T_0 p_0^2 \right) \text{ dB} \quad (\text{A-2})$$

where T_0 is a reference time interval of 1 s. SEL continues to increase with time when non-zero pressure signals are present. It is a dose-type measurement, so the integration time applied must be carefully considered for its relevance to impact to the exposed recipients.

SEL can be calculated over a fixed duration, such as the time of a single event or a period with multiple acoustic events. When applied to pulsed sounds, SEL can be calculated by summing the SEL of the N individual pulses. For a fixed duration, the square pressure is integrated over the duration of interest. For multiple events, the SEL can be computed by summing (in linear units) the SEL of the N individual events:

$$L_{E,N} = 10 \log_{10} \left(\sum_{i=1}^N 10^{\frac{L_{E,i}}{10}} \right) \text{ dB} . \quad (\text{A-3})$$

If applied, the frequency weighting of an acoustic event should be specified, as in the case of weighted SEL (e.g., $L_{E,LFC,24h}$; Appendix 0). The use of fast, slow, or impulse exponential-time-averaging or other time-related characteristics should also be specified.

A.2. Decidecade Band Analysis

The distribution of a sound’s power with frequency is described by the sound’s spectrum. The sound spectrum can be split into a series of adjacent frequency bands. Splitting a spectrum into 1 Hz wide bands, called passbands, yields the power spectral density of the sound. This splitting of the spectrum into passbands of a constant width of 1 Hz, however, does not represent how animals perceive sound.

Because animals perceive exponential increases in frequency rather than linear increases, analysing a sound spectrum with passbands that increase exponentially in size better approximates real-world scenarios. In underwater acoustics, a spectrum is commonly split into decidecade bands, which are one tenth of a decade wide. A decidecade is sometimes referred to as a “decidecade” because one tenth of a decade is approximately equal to one third of an octave. Each decade represents a factor 10 in sound frequency. Each octave represents a factor 2 in sound frequency. The centre frequency of the i th band, $f_c(i)$, is defined as:

$$f_c(i) = 10^{\frac{i}{10}} \text{ kHz} \tag{A-4}$$

and the low (f_{lo}) and high (f_{hi}) frequency limits of the i th decade band are defined as:

$$f_{lo,i} = 10^{\frac{-1}{20}} f_c(i) \quad \text{and} \quad f_{hi,i} = 10^{\frac{1}{20}} f_c(i) \tag{A-5}$$

The decidecade bands become wider with increasing frequency, and on a logarithmic scale the bands appear equally spaced (Figure A-1). The acoustic modelling spans from band 10 ($f_c(10) = 10 \text{ Hz}$) to band 44 ($f_c(44) = 25 \text{ kHz}$).

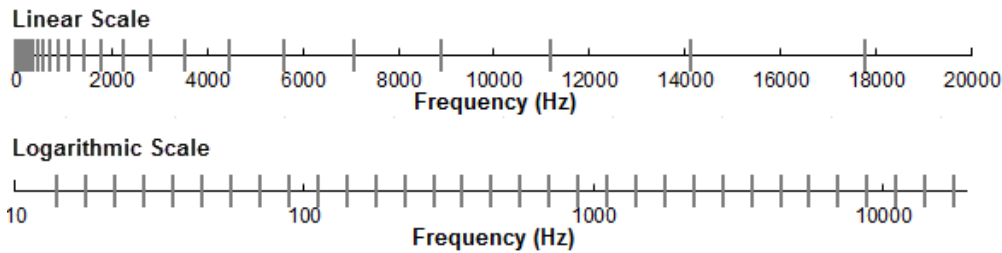


Figure A-1. Decidecade frequency bands (vertical lines) shown on a linear frequency scale and a logarithmic scale.

The sound pressure level in the i th band ($L_{p,i}$) is computed from the spectrum $S(f)$ between $f_{lo,i}$ and $f_{hi,i}$:

$$L_{p,i} = 10 \log_{10} \int_{f_{lo,i}}^{f_{hi,i}} S(f) df \text{ dB} \tag{A-6}$$

Summing the sound pressure level of all the bands yields the broadband sound pressure level:

$$\text{Broadband SPL} = 10 \log_{10} \sum_i 10^{\frac{L_{p,i}}{10}} \text{ dB} \tag{A-7}$$

Figure A-2 shows an example of how the decidecade band sound pressure levels compare to the sound pressure spectral density levels of an ambient noise signal. Because the decidecade bands are wider than 1 Hz, the decidecade band SPL is higher than the spectral levels at higher frequencies. Acoustic modelling of decidecade bands requires less computation time than 1 Hz bands and still resolves the frequency-dependence of the sound source and the propagation environment.

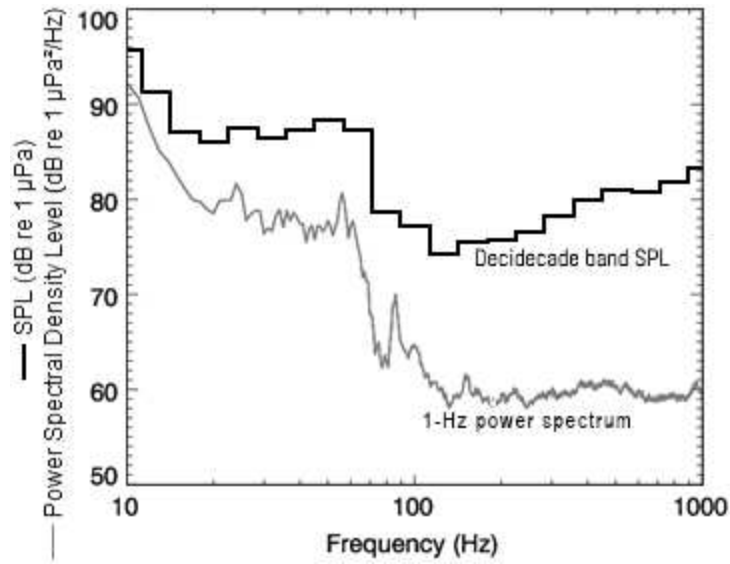


Figure A-2. Sound pressure spectral density levels and the corresponding decidecade band sound pressure levels of example ambient noise shown on a logarithmic frequency scale. Because the decidecade bands are wider with increasing frequency, the decidecade-octave-band SPL is higher than the power spectrum.

A.3. Marine Mammal Noise Effect Criteria

It has been long recognised that marine mammals can be adversely affected by underwater anthropogenic noise. For example, Payne and Webb (1971) suggest that communication distances of fin whales are reduced by shipping sounds. Subsequently, similar concerns arose regarding effects of other underwater noise sources and the possibility that impulsive sources—primarily airguns used in seismic surveys—could cause auditory injury. This led to a series of workshops held in the late 1990s, conducted to address acoustic mitigation requirements for seismic surveys and other underwater noise sources (NMFS 1998, ONR 1998, Nedwell and Turnpenny 1998, HESS 1999, Ellison and Stein 1999). In the years since these early workshops, a variety of thresholds have been proposed for auditory injury, impairment, and disturbance. The following sections summarise the recent development of thresholds; however, this field remains an active research topic.

A.3.1. Injury and Hearing Sensitivity Changes

In recognition of shortcomings of the SPL-only based auditory injury criteria, in 2005 NMFS sponsored the Noise Criteria Group to review literature on marine mammal hearing to propose new noise exposure criteria. Some members of this expert group published a landmark paper (Southall et al. 2007) that suggested assessment methods similar to those applied for humans. The resulting recommendations introduced dual auditory injury criteria for impulsive sounds that included peak pressure level thresholds and SEL_{24h} thresholds, where the subscripted 24h refers to the accumulation period for calculating SEL. The peak pressure level criterion is not frequency weighted whereas SEL_{24h} is frequency weighted according to one of four marine mammal species hearing groups: low-, mid- and high-frequency cetaceans (LF, MF, and HF cetaceans, respectively) and Pinnipeds in Water (PINN). These weighting functions are referred to as M-weighting filters (analogous to the A-weighting filter for humans; see Appendix 0). The SEL_{24h} thresholds were obtained by extrapolating measurements of onset levels of Temporary Threshold Shift (TTS) in belugas by the amount of TTS required to produce Permanent Threshold Shift (PTS) in chinchillas. The Southall et al. (2007) recommendations do not specify an exchange rate, which suggests that the thresholds are the same regardless of the duration of exposure (i.e., it implies a 3 dB exchange rate).

Wood et al. (2012) refined Southall et al.'s (2007) thresholds, suggesting lower PTS and TTS values for LF and HF cetaceans while retaining the filter shapes. Their revised thresholds were based on TTS-onset levels in harbour porpoises from Lucke et al. (2009), which led to a revised impulsive sound PTS threshold for HF cetaceans of 179 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$. Because there were no data available for baleen whales, Wood et al. (2012) based their recommendations for LF cetaceans on results obtained from MF cetacean studies. In particular they referenced the Finneran and Schlundt (2010) research, which found mid-frequency cetaceans are more sensitive to non-impulsive sound exposure than Southall et al. (2007) assumed. Wood et al. (2012) thus recommended a more conservative TTS-onset level for LF cetaceans of 192 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$.

As of 2017, a definitive approach is still not apparent. There is consensus in the research community that an SEL-based method is preferable, either separately or in addition to an SPL-based approach to assess the potential for injuries. In August 2016, after substantial public and expert input into three draft versions and based largely on the above-mentioned literature (NOAA 2013, 2015, 2016), NMFS finalised technical guidance for assessing the effect of anthropogenic sound on marine mammal hearing (NMFS 2016). The guidance describes auditory injury criteria with new thresholds and frequency weighting functions for the five hearing groups described by Finneran and Jenkins (2012). The latest revision to this work was published in 2018 (NMFS 2018). Southall et al. (2019) revisited the interim criteria published in 2007. All noise exposure criteria in NMFS (2018) and Southall et al. (2019) are identical (for impulsive and non-impulsive sounds); however, the mid-frequency cetaceans from NMFS (2018) are classified as high-frequency cetaceans in Southall et al. (2019), and high-frequency cetaceans from NMFS (2018) are classified as very-high-frequency cetaceans in Southall et al. (2019).

Southall et al. (2019) are identical (for impulsive and non-impulsive sounds); however, the mid-frequency cetaceans from NMFS (2018) are classified as high-frequency cetaceans in Southall et al. (2019), and high-frequency cetaceans from NMFS (2018) are classified as very-high-frequency cetaceans in Southall et al. (2019).

A.3.2. Behavioural Response

Numerous studies on marine mammal behavioural responses to sound exposure have not resulted in consensus in the scientific community regarding the appropriate metric for assessing behavioural reactions. However, it is recognised that the context in which the sound is received affects the nature and extent of responses to a stimulus (Southall et al. 2007, Ellison and Frankel 2012, Southall et al. 2016, Southall et al. 2021).

A.3.2.1. Non-Impulsive Noise

NMFS currently uses step function (all-or-none) threshold of 120 dB re 1 μ Pa SPL (unweighted) for non-impulsive sounds to assess and regulate noise-induced behavioural impacts on marine mammals (NOAA 2019). The 120 dB re 1 μ Pa threshold is associated with continuous sources and was derived based on studies examining behavioural responses to drilling and dredging, referring to Malme et al. (1983), Malme et al. (1984), and Malme et al. (1986), which were considered in Southall et al. (2007). Malme et al. (1986) found that playback of drillship noise did not produce clear evidence of disturbance or avoidance for levels below 110 dB re 1 μ Pa (SPL), possible avoidance occurred for exposure levels approaching 119 dB re 1 μ Pa. Malme et al. (1984) determined that measurable reactions usually consisted of rather subtle short-term changes in speed and/or heading of the whale(s) under observation. It has been shown that both received level and proximity of the sound source is a contributing factor in eliciting behavioural reactions in humpback whales (Dunlop et al. 2017, Dunlop et al. 2018).

A.3.2.2. Impulsive Noise

For impulsive noise, NMFS currently uses step function thresholds of 160 dB re 1 μ Pa SPL (unweighted) to assess and regulate noise-induced behavioural impacts for marine mammals (NOAA 2018, NOAA 2019). The threshold for impulsive sound is derived from the High-Energy Seismic Survey (HESS) panel (HESS 1999) report that, in turn, is based on the responses of migrating mysticete whales to airgun sounds (Malme et al. 1984). For impulsive noise, NMFS currently uses step function thresholds of 160 dB re 1 μ Pa SPL (unweighted) to assess and regulate noise-induced behavioural impacts for marine mammals (NOAA 2018, NOAA 2019). The threshold for impulsive sound is derived from the High-Energy Seismic Survey (HESS) panel (HESS 1999) report that, in turn, is based on the responses of migrating mysticete whales to airgun sounds (Malme et al. 1984). The HESS team recognised that behavioural responses to sound may occur at lower levels, but significant responses were only likely to occur above a SPL of 140 dB re 1 μ Pa. Southall et al. (2007) found varying responses for most marine mammals between a SPL of 140 and 180 dB re 1 μ Pa, consistent with the HESS (1999) report, but lack of convergence in the data prevented them from suggesting explicit step functions.

A.4. Marine Mammal Frequency Weighting

The potential for noise to affect animals of a certain species depends on how well the animals can hear it. Noises are less likely to disturb or injure an animal if they are at frequencies that the animal cannot hear well. An exception occurs when the sound pressure is so high that it can physically injure an animal by non-auditory means (i.e., barotrauma). For sound levels below such extremes, the importance of sound components at particular frequencies can be scaled by frequency weighting relevant to an animal's sensitivity to those frequencies (Nedwell and Turnpenny 1998, Nedwell et al. 2007).

A.4.1. Marine Mammal Frequency Weighting Functions

In 2015, a US Navy technical report by Finneran (2015) recommended new auditory weighting functions. The auditory weighting functions for marine mammals are applied in a similar way as A-weighting for noise level assessments for humans. The new frequency-weighting functions are expressed as:

$$G(f) = K + 10 \log_{10} \left\{ \frac{(f/f_1)^{2a}}{[1 + (f/f_1)^2]^a [1 + (f/f_2)^2]^b} \right\} \quad (\text{A-8})$$

Finneran (2015) proposed five functional hearing groups for marine mammals in water: low-, mid-, and high-frequency cetaceans, phocid pinnipeds, and otariid pinnipeds. The parameters for these frequency-weighting functions were further modified the following year (Finneran 2016) and were adopted in NOAA's technical guidance that assesses acoustic impacts on marine mammals (NMFS 2018). The updates did not affect the content related to either the definitions of M-weighting functions or the threshold values. Table A-1 lists the frequency-weighting parameters for each hearing group; Figure A-3 shows the resulting frequency-weighting curves.

Table A-1. Parameters for the auditory weighting functions as recommended by Southall et al. (2019).

Hearing group	<i>a</i>	<i>b</i>	<i>f</i> _{lo} (Hz)	<i>f</i> _{hi} (kHz)	<i>K</i> (dB)
Low-frequency cetaceans (baleen whales)	1.0	2	200	19,000	0.13
High-frequency cetaceans (dolphins, plus toothed, beaked, and bottlenose whales)	1.6	2	8,800	110,000	1.20
Very high-frequency cetaceans (true porpoises, <i>Kogia</i> , river dolphins, cephalorhynchid, <i>Lagenorhynchus cruciger</i> and <i>L. australis</i>)	1.8	2	12,000	140,000	1.36
Phocid seals in water	1.0	2	1,900	30,000	0.75
Otariid seals in water	2.0	2	940	25,000	0.64

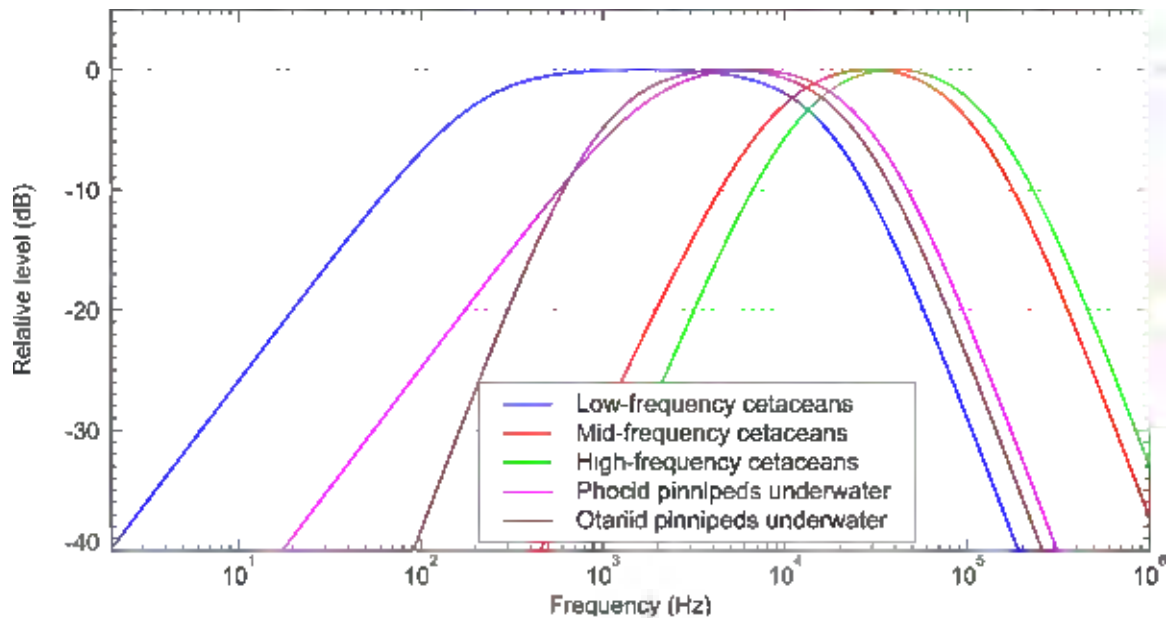


Figure A-3. Auditory weighting functions for functional marine mammal hearing groups as recommended by Southall et al. (2019).

Appendix B. VSP Source

B.1. Airgun Array Source Model

The source levels and directivity of the seismic source were predicted with JASCO's Airgun Array Source Model (AASM). AASM includes low- and high-frequency modules for predicting different components of the seismic source spectrum. The low-frequency module is based on the physics of oscillation and radiation of airgun bubbles, as originally described by Ziolkowski (1970), that solves the set of parallel differential equations that govern bubble oscillations. Physical effects accounted for in the simulation include pressure interactions between airguns, port throttling, bubble damping, and generator-injector (GI) gun behaviour discussed by Dragoset (1984), Laws et al. (1990), and Landrø (1992). A global optimisation algorithm tunes free parameters in the model to a large library of airgun source signatures.

While airgun signatures are highly repeatable at the low frequencies, which are used for seismic imaging, their sound emissions have a large random component at higher frequencies that cannot be predicted using a deterministic model. Therefore, AASM uses a stochastic simulation to predict the high-frequency (800–25,000 Hz) sound emissions of individual airguns, using a data-driven multiple-regression model. The multiple-regression model is based on a statistical analysis of a large collection of high quality seismic source signature data recently obtained from the Joint Industry Program (JIP) on Sound and Marine Life (Mattsson and Jenkerson 2008). The stochastic model uses a Monte-Carlo simulation to simulate the random component of the high-frequency spectrum of each airgun in an array. The mean high-frequency spectra from the stochastic model augment the low-frequency signatures from the physical model, allowing AASM to predict airgun source levels at frequencies up to 25,000 Hz.

AASM produces a set of “notional” signatures for each array element based on:

- Array layout
- Volume, operating depth, and firing pressure of each airgun
- Interactions between different airguns in the array

These notional signatures are the pressure waveforms of the individual airguns at a standard reference distance of 1 m; they account for the interactions with the other airguns in the array. The signatures are summed with the appropriate phase delays to obtain the far-field source signature of the entire array in all directions. This far-field array signature is filtered into decidecade bands to compute the source levels of the array as a function of frequency band and azimuthal angle in the horizontal plane (at the source depth), after which it is considered a directional point source in the far field.

A seismic array consists of many sources and the point source assumption is invalid in the near field where the array elements add incoherently. The maximum extent of the near field of an array (R_{nf}) is:

$$R_{nf} < \frac{l^2}{4\lambda} \quad (\text{B-1})$$

where λ is the sound wavelength and l

is the longest dimension of the array (Lurton 2002, §5.2.4). For example, a seismic source length of $l = 21$ m yields a near-field range of 147 m at 2 kHz and 7 m at 100 Hz. Beyond this R_{nf} range, the array is assumed to radiate like a directional point source and is treated as such for propagation modelling.

The interactions between individual elements of the array create directionality in the overall acoustic emission. Generally, this directionality is prominent mainly at frequencies in the mid-range between tens of hertz to several hundred hertz. At lower frequencies, with acoustic wavelengths much larger

than the inter-airgun separation distances, the directionality is small. At higher frequencies, the pattern of lobes is too finely spaced to be resolved and the effective directivity is less.

B.2. VSP Source Parameters

The layout of the seismic source is provided in Figure B-1. Details of the airgun parameters are provided in Table B-1. In the context of this source geometry the broadside direction is perpendicular to the sagittal plane of the array and the endfire direction is parallel to the sagittal plane of the array.

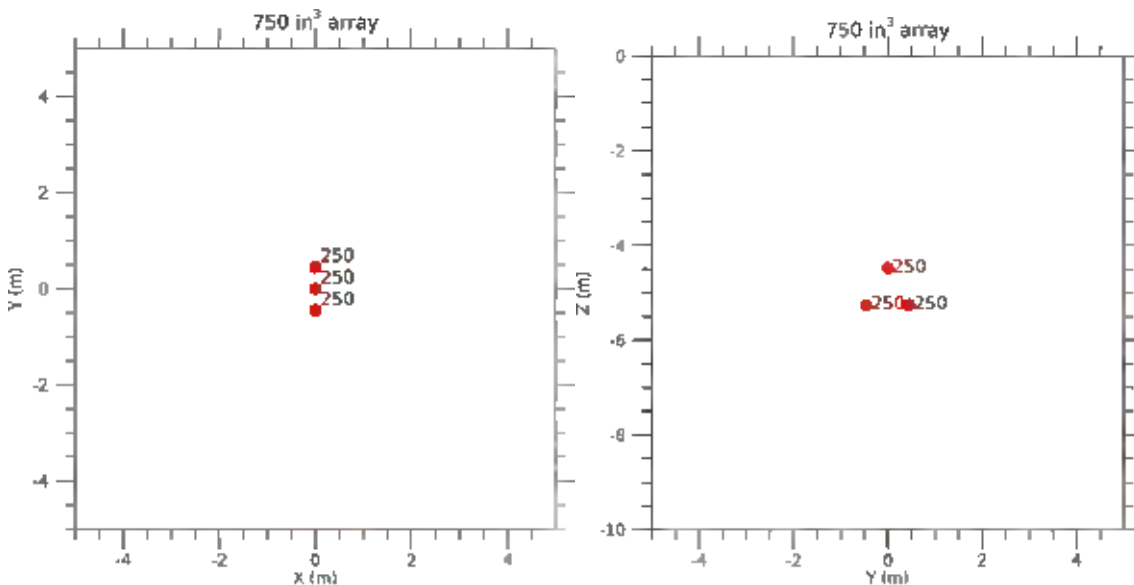


Figure B-1. (Left) Plan and (right) side layouts of the modelled 750 in³ seismic source array. Operational depth is 5 m. The labels indicate the firing volume (in cubic inches) for each airgun. Also see Table B-1.

Table B-1. Layout of the modelled 750 in³ seismic source array. Operational depth is 5 m. Firing pressure for all guns is 2000 psi. Also see Figure B-1.

Gun	x (m)	y (m)	z (m)	Volume (in ³)
1	0.0	0.0	4.48	250
2	0.0	0.45	5.26	250
3	0.0	-0.45	5.26	250

B.3. Array Source Levels and Directivity

Figure B-2 shows the broadside (perpendicular to the sagittal plane), endfire (parallel to the sagittal plane), and vertical overpressure signature and corresponding power spectrum levels for the 750 in³ array (see Appendix B.2). Horizontal decade band source levels shown as a function of band centre frequency and azimuth (Figure B-3) indicate that this array is mainly isotropic.

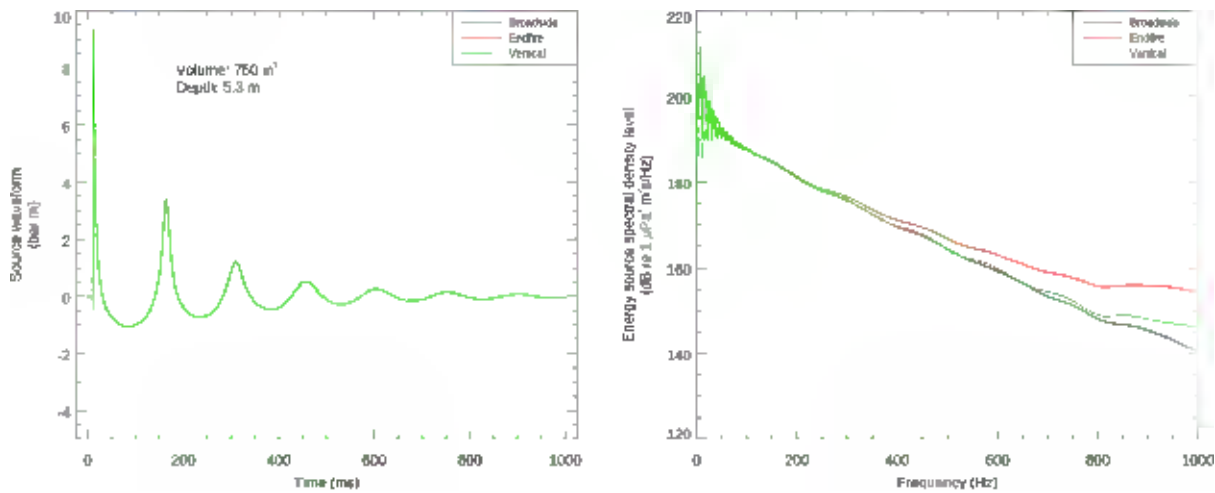


Figure B-2. Predicted source level details for the 750 in³ array at a 5 m operational depth. (Left) the overpressure signature and (right) the power spectrum for horizontal (broadside and endfire) and vertical directions.

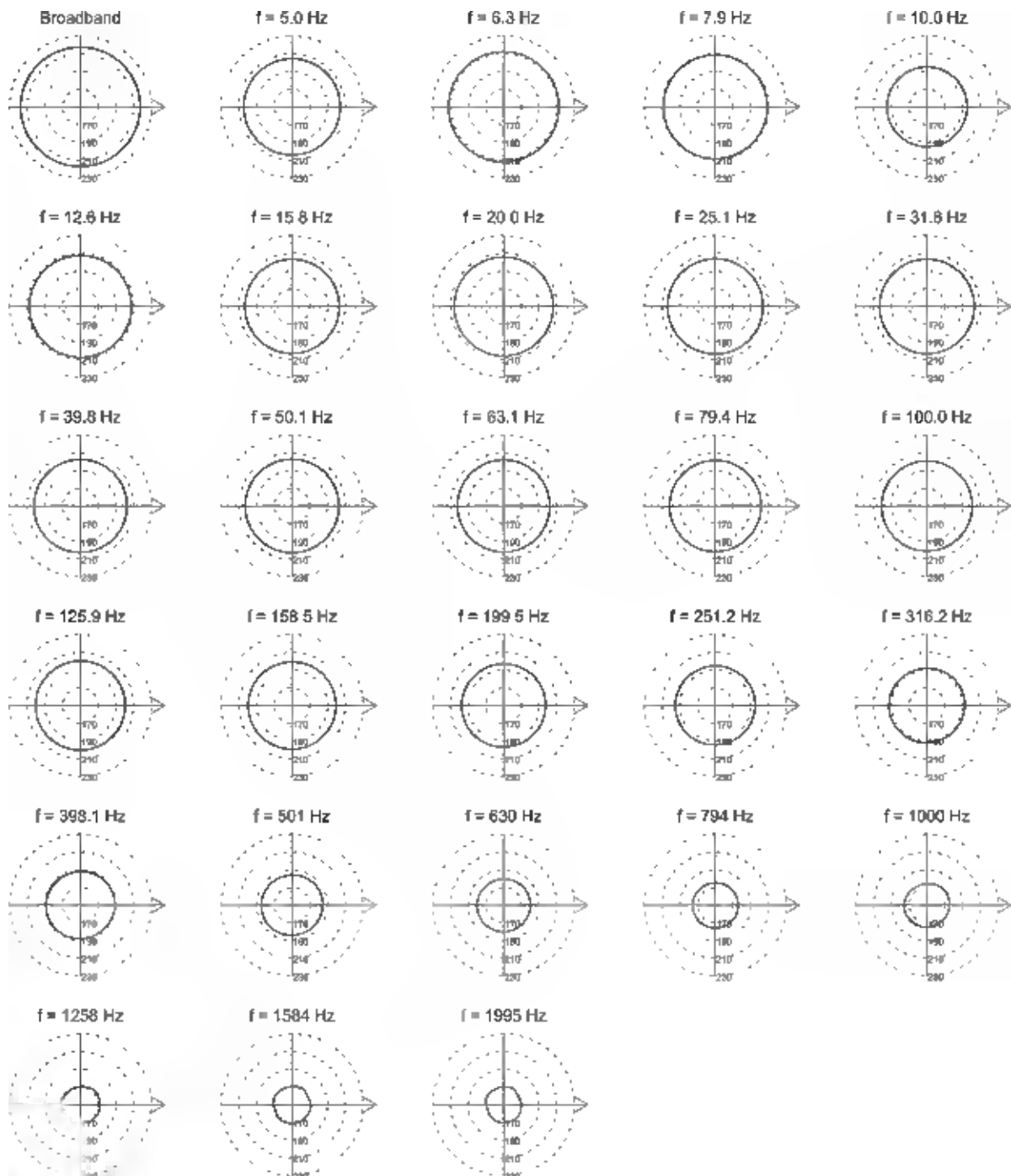


Figure B-3. Directionality of the predicted horizontal source levels for the 750 in³ seismic source array, 10 Hz to 2 kHz. Source levels (in dB re 1 $\mu\text{Pa}^2\cdot\text{s m}^2$) are shown as a function of azimuth for the centre frequencies of the decade bands modelled, shown above the plots. The endfire axis (i.e., axis parallel to the sagittal plane) is to the right. Operational depth is 5 m.

Appendix C. Survey and Positioning Equipment.

C.1. Equipment Descriptions

C.1.1. Underwater Acoustic Positioning

USBL (Ultra-short Base Line) acoustic positioning system will be utilised onboard the Campaign vessels. This tool is used to locate the position of a single subsea transponder that will be placed temporarily on the seabed and subsequently recovered. The USBL system uses a vessel mounted transceiver to detect the range and bearing to a target using acoustic signals.

C.1.2. Single-beam Echo Sounders and Multi-beam Echo Sounders

Single-beam echo sounders (SBES) use a hydrographic technique that provides the water depths and an image of the seabed and pipeline by measuring the two-way travel time of a high frequency sound pulse emitted by a transducer. The transducer, generally mounted on a vessel or to an Autonomous Underwater Vehicle (AUV), also tracks the motion of the unit it is mounted on in order to allow for correction for the motion. Multi-beam echo sounders (MBES) work in the same way but produce a swath or acoustic fan shaped pulse of sound made up of many single beams. A MBES acquires a wide swath (strip) of bathymetry data perpendicular to the vessel track and provides total seabed coverage with no gaps between vessel tracks. Different MBES systems are available for all water depths between 1 m and 12,000 m. The transducer(s) 'listen' for the reflected energy from the seabed. The fans of seabed coverage form a series of strips along each track, which are lined up side-by-side to generate two dimensional georeferenced bathymetric maps of the seabed. MBES surveys will enable the collection of bathymetry data and the correlation of depth information. This type of survey uses a sonar system to transmit short pulses of sound energy, analysing the return signal from the seafloor or other objects.

C.1.3. Side Scan Sonar Surveys (SSS)

SSS is a marine geophysical technique that is used to produce an image of the seafloor and identify obstructions or features. This type of survey is a hydro-acoustic technique, comprising a set of transducers mounted on either side of a towed vehicle, towed approximately 10-20 m above the seabed. SSS transducers may be mounted on AUV systems, vessel hulls or, more commonly, using an ROV.

C.2. Noise Emissions

C.2.1. Underwater Acoustic Positioning

An acoustic pulse is transmitted by the transceiver and detected by the subsea transponder, which replies with its own acoustic pulse. This return pulse is detected by the shipboard transceiver. The time from the transmission of the initial acoustic pulse until the reply is detected is measured by the USBL system and is converted into a range. To calculate a subsea position, the USBL calculates both a range and an angle from the transceiver to the subsea beacon. Angles are measured by the transceiver, which contains an array of transducers. The transducer will then send sound signals, typically at 19 to 33 kHz to a USBL transponder.

A typical and widely used USBL system is the Sonardyne Ranger USBL. The source level and frequency range of this system from previous field measurements (Warner and McCrodon 2011) were found to be 18-36 kHz and 204 dB re 1 μPa @1m (SPL). The per-pulse SEL source level was 173 dB re 1 $\mu\text{Pa}^2\text{s}$ @ 1 m, and the measured maximum Peak (PK) was approximately 170 dB re 1 μPa at 30 m. This source can be considered an impulsive sound source for impact assessment purposes for this study. Austin et al. (2012) calculated the distances to SPL isopleths for the Ranger USBL in open water and found the distance to 160 dB re 1 μPa (SPL) to be 36 m. Considering 1000 impulses at 40 m range through summing the received SEL from each impulse results in an unweighted SEL of 144 dB re 1 $\mu\text{Pa}^2\text{s}$, which can be used in a conservative comparison against relevant SEL impact assessment thresholds.

C.2.2. Single-beam Echo Sounders and Multi-beam Echo Sounders

Typical MBESs used in survey work include the Reson Seabat and the R2Sonic products. These systems operate at 200-400kHz, with a variable total beam width, although 60° is common. For example, the transmit power from a R2Sonic 2024 echo sounder is up to 221 dB re 1 μPa at 1m (SPL), with a short (15 μs to 1 ms) pulse width, however the operational power level and pulse width influence the potential sound fields. This source can be considered an impulsive sound source for impact assessment purposes for this study. Measurements for the R2Sonic 2024 were reported in Martin et al. (2012), who measured a maximum SPL of 162 dB re 1 μPa at 4 m, with the system operating at an average pulse length of 0.11 ms. The accumulated SEL over 363 measured pulses was 121.5 dB re 1 $\mu\text{Pa}^2\text{s}$. Measurements of another similar system, the Reson SeaBat 8101 MBES operating at 240 kHz were reported in Chorney et al. (2011). These measurements show that at 40 m, the PK levels are approximately 170 dB re 1 μPa , and the per-pulse SEL 130 dB re 1 $\mu\text{Pa}^2\text{s}$. Zykov (2013) modelled an R2Sonic 2022, another similar MBES, and found that the sound levels would not exceed an unweighted 171 dB re 1 $\mu\text{Pa}^2\text{s}$ more than 2 m from the source while conducting a 2.5 h geophysical survey. The models of MBES considered in this study are those which generate only high frequency signals (therefore excluding the lower frequency units), and as such will only be relevant for fauna with sensitivity to signals of approximately 200 kHz or higher, which excludes low-frequency cetaceans, fish, and turtles.

SBESs are less powerful than MBESs, therefore the information supplied for MBES is considered representative of the potential outputs from SBES.

C.2.3. Side Scan Sonar Surveys (SSS)

The sonar is highly directional, with distances to sound levels outside the beam significantly less than those in the beam. SSS towfish are typically towed approximately 10 to 20 metres above the seabed, thus the beam will be restricted to a swath close to the seabed. These towfish can use a range of operating frequencies, but typically they are between 70 and 400 kHz. Representative systems could include those from Edgetech, such as the 4200 range. They output signals at 120 and 410 kHz. Measurements of an EdgeTech 4200 were reported in Crocker and Fratantonio (2016) for 100 and 400 kHz modes, with a maximum per-pulse source level of 176 dB re 1 $\mu\text{Pa}^2\text{s}$ @ 1m (SEL), 205 dB re 1 μPa @ 1m (SPL) and 210 dB re 1 μPa @1m (PK). Austin et al. (2013a) also measured the system during an operational program, focusing on the 120 kHz impulses. The authors reported a PK of less than 175 dB re 1 μPa and an SPL of less than 170 dB re 1 μPa at 39 m, with the distance from in-beam pulses to an SPL of 160 dB re 1 μPa calculated to be 130 m.

The SSS models considered here are those which generate only high frequency signals, and as such will only be relevant for fauna with sensitivity to signals of approximately 110 kHz or higher, as shown in Austin et al. (2013a), which excludes low-frequency cetaceans, fish, and turtles.

C.3. Impact

C.3.1. Marine Mammals

The sound levels from positioning equipment are described Section C.2.1. As discussed above, the proposed equipment has sound levels which could reach the marine mammal behavioural threshold within 36 m. A nominal accumulation scenario for 1000 impulses results in an unweighted accumulated SEL well below thresholds for PTS and TTS in marine mammals. The measured PK at 30 m was 170 dB re 1 μ Pa is well below thresholds for PTS and TTS in marine mammals. Therefore, PTS and TTS thresholds (Table 13) are not predicted to be exceeded from the positioning equipment.

The sound levels from MBES are described in Section C.2.2. The measurement study from Martin et al. (2012) indicates that the behavioural response threshold (Table 13) could be exceeded within less than 10 m. PTS and TTS thresholds due to SEL are not predicted to be exceeded, considering that a measurement of along a track line with a closest point of approach of 4 m did not result in accumulated unweighted levels higher than 121.5 dB re 1 μ Pa²s. PTS and TTS thresholds due to PK are not predicted to be exceeded, considering measurement of 170 dB re 1 μ Pa PK at 40 m. Therefore, considering both SEL and PK metrics, PTS and TTS thresholds (Table 13) are not predicted to be exceeded from MBES and subsequently SBES.

The sound levels from SSS are described in Section C.2.3. The measurement study Austin et al. (2013) indicates that the behavioural threshold (Table 13) could be exceeded within less than 130 m for marine mammals within the highly directional source output beam pattern. The reported per-pulse sound levels at 40 m are like those from the MBES, and as it isn't predicted to exceed either the PTS or TTS thresholds considering both SEL and PK metrics (Table 13), neither is the SSS. Additionally, the per-pulse peak pressure source level of the SSS is below the PK criteria threshold, therefore the criteria cannot be exceeded.

Survey and positioning equipment could cause masking of vocalisations of cetaceans due to the overlap in frequency range between signals and vocalisations. However, due to the limited propagation range of the relevant frequencies (higher frequencies attenuate rapidly), the range at which the impact could occur will be small, within hundreds of meters. The masking will apply to MF cetaceans for the positioning equipment, MBES, and SSS, with all signals above 2 kHz.

Given the transient and mobile nature of the survey, the operating frequencies and noise maxima of the survey equipment considered here, effects of survey equipment noise on marine mammals are expected to be limited to behavioural responses proximal to the vessel, ranges less than those from the vessel by itself.

Appendix D. Methods and Parameters

D.1. Sound Propagation Models

D.1.1. Propagation Loss

The propagation of sound through the environment was modelled by predicting the acoustic propagation loss—a measure, in decibels, of the decrease in sound level between a source and a receiver some distance away. Geometric spreading of acoustic waves is the predominant way by which propagation loss occurs. Propagation loss also happens when the sound is absorbed and scattered by the seawater, and absorbed scattered, and reflected at the water surface and within the seabed. Propagation loss depends on the acoustic properties of the ocean and seabed; its value changes with frequency.

If the acoustic energy source level (ESL), expressed in dB re 1 $\mu\text{Pa}^2\cdot\text{s m}^2$, and propagation loss (PL), in units of dB, at a given frequency are known, then the received level (RL) at a receiver location can be calculated in dB re 1 $\mu\text{Pa}^2\cdot\text{s}$ by:

$$\text{RL} = \text{SL} - \text{PL} . \quad (\text{D-1})$$

D.1.2. MONM-BELLHOP

Long-range sound fields were computed using JASCO's Marine Operations Noise Model (MONM). While other models may be more accurate for steep-angle propagation in high-shear environment, MONM is well suited for effective longer-range estimation. This model computes sound propagation at frequencies of 10 Hz to 1.6 kHz via a wide-angle parabolic equation solution to the acoustic wave equation (Collins 1993) based on a version of the US Naval Research Laboratory's Range-dependent Acoustic Model (RAM), which has been modified to account for a solid seabed (Zhang and Tindle 1995). MONM computes sound propagation at frequencies >1.6 kHz via the BELLHOP Gaussian beam acoustic ray-trace model (Porter and Liu 1994).

The parabolic equation method has been extensively benchmarked and is widely employed in the underwater acoustics community (Collins et al. 1996). MONM accounts for the additional reflection loss at the seabed, which results from partial conversion of incident compressional waves to shear waves at the seabed and sub-bottom interfaces, and it includes wave attenuations in all layers. MONM incorporates the following site-specific environmental properties: a bathymetric grid of the modelled area, underwater sound speed as a function of depth, and a geoacoustic profile based on the overall stratified composition of the seafloor.

MONM computes acoustic fields in three dimensions by modelling propagation loss within two-dimensional (2-D) vertical planes aligned along radials covering a 360° swath from the source, an approach commonly referred to as N×2-D. These vertical radial planes are separated by an angular step size of $\Delta\theta$, yielding $N = 360^\circ/\Delta\theta$ number of planes (Figure D-1).

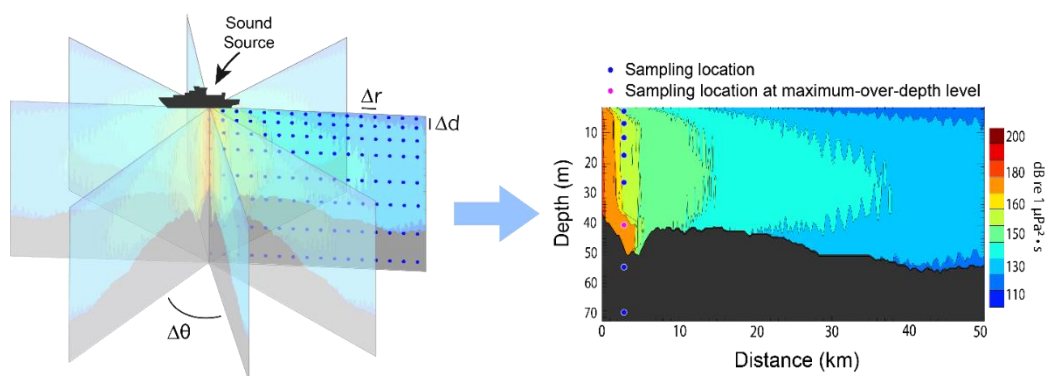


Figure D-1. The N×2-D and maximum-over-depth modelling approach used by MONM.

MONM treats frequency dependence by computing acoustic propagation loss at the centre frequencies of decade bands. Sufficiently many decade frequency-bands, starting at 10 Hz, are modelled to include most of the acoustic energy emitted by the source. At each centre frequency, the propagation loss is modelled within each of the N vertical planes as a function of depth and range from the source. The decade received per-second SEL are computed by subtracting the band propagation loss values from the directional source level in that frequency band. Composite broadband received per-second SEL are then computed by summing the received decade levels.

The received 1-s SEL sound field within each vertical radial plane is sampled at various ranges from the source, generally with a fixed radial step size. At each sampling range along the surface, the sound field is sampled at various depths, with the step size between samples increasing with depth below the surface. The step sizes are chosen to provide increased coverage near the depth of the source and at depths of interest in terms of the sound speed profile. For areas with deep water, sampling is not performed at depths beyond those reachable by marine mammals. The received per-pulse or per-second SEL at a surface sampling location is taken as the maximum value that occurs over all samples within the water column, i.e., the maximum-over-depth received per-second SEL. These maximum-over-depth per-second SEL are presented as colour contours around the source.

D.1.3. Noise Propagation with FWRAM

For impulsive sounds from impact pile driving, time-domain representations of the pressure waves generated in the water are required to calculate SPL and peak pressure level. Furthermore, the pile must be represented as a distributed source to accurately characterise vertical directivity effects in the near-field zone. For this study, synthetic pressure waveforms were computed using JASCO's Full Waveform Range-dependent Acoustic Model (FWRAM). FWRAM computes acoustic propagation via a wide-angle parabolic equation solution to the acoustic wave equation (Collins 1993) based on a version of the US Naval Research Laboratory's Range-dependent Acoustic Model (RAM), which has been modified to account for an elastic seabed (Zhang and Tindle 1995). The parabolic equation method has been extensively benchmarked and is widely employed in the underwater acoustics community (Collins et al. 1996). FWRAM accounts for the additional reflection loss at the seabed due to partial conversion of incident compressional waves to shear waves at the seabed and sub-bottom interfaces, and it includes wave attenuations in all layers. FWRAM incorporates the following site-specific environmental properties: a modelled area bathymetric grid, underwater sound speed as a function of depth, and a geoaoustic profile based on the overall stratified composition of the seafloor.

FWRAM computes pressure waveforms via Fourier synthesis of the modelled acoustic transfer function in closely spaced frequency bands. FWRAM employs the VSP array starter method to accurately model sound propagation from a spatially distributed source (MacGillivray and Chapman 2012).

Synthetic pressure waveforms from the VSP array were modelled and post-processed, after applying a travel time correction, to calculate SPL, SEL and PK metrics versus range and depth from the source.

D.1.4. Wavenumber Integration Model

Sound pressure levels near the seismic source were modelled using JASCO's VSTACK wavenumber integration model. VSTACK computes synthetic pressure waveforms versus depth and range for arbitrarily layered, range-independent acoustic environments using the wavenumber integration approach to solve the exact (range-independent) acoustic wave equation. This model is valid over the full angular range of the wave equation and can fully account for the elasto-acoustic properties of the sub-bottom. Wavenumber integration methods are extensively used in the field of underwater acoustics and seismology where they are often referred to as reflectivity methods or discrete wavenumber methods. VSTACK computes sound propagation in arbitrarily stratified water and seabed layers by decomposing the outgoing field into a continuum of outward-propagating plane cylindrical waves. Seabed reflectivity in the model is dependent on the seabed layer properties: compressional and shear wave speeds, attenuation coefficients, and layer densities. The output of the model can be post-processed to yield estimates of the SEL, SPL, and PK.

VSTACK accurately predicts steep-angle propagation in the proximity of the source, but it is computationally slow at predicting sound pressures at large distances due to the need for smaller wavenumber steps with increasing distance. Additionally, VSTACK assumes range-invariant bathymetry with a horizontally stratified medium (i.e., a range-independent environment) which is azimuthally symmetric about the source. VSTACK is thus best suited to modelling the sound field near the source.

D.1.5. Limestone Seabed Propagation Loss

For sites where the seabed geoacoustic model consisted of bare calcarenite, an additional broadband correction was applied to the propagation loss results from MONM to better account for the additional propagation loss associated with a limestone (calcarenite) seabed (Duncan et al. 2009). The accuracy of the broadband calculated propagation loss for the South-eastern continental shelf of Australia depends significantly upon the frequency content of the radiating sound source together with thickness of any overlying layers of unconsolidated sediment (e.g., sand) on top of calcarenite likely to occur within the region.

In general, the thinner the sand layer, the greater the overall propagation loss. When comparing SPL data McPherson et al. (2021), higher rates of propagation loss were observed and were attributed to, an absorptive carbonate (calcarenite) seabed. In this study, comparisons were conducted using JASCO's Marine Operations Noise Model (MONM), a wide-angle parabolic equation model which applies the BELLHOP Gaussian beam acoustic ray-trace model at higher frequencies, and JASCO's wavenumber integration model (VSTACK, Appendix D.1.4) which can fully account for the elasto-acoustic properties of the sub-bottom.

To account for the additional propagation loss associated with a cemented calcarenite seabed, an additional broadband correction was applied to the propagation loss results from MONM to account for the higher rates of loss when the full for the elasto-acoustic properties of the sub-bottom are consider. The differences between the broadband SPL from MONM and VSTACK were extracted at the same modelled ranges and depths that corresponded range independent predictions. The 90th percentile of the resultant dB differences in 250 m range bins were selected to generate a correction function for each individual site/source to be modelled. The conversion functions were applied after the propagation loss calculation from MONM but before summing decidecade band levels, gridding, and radii calculations for each modelled site in each modelled scenario considered.

D.2. Environmental Parameters

D.2.1. Bathymetry

Water depths throughout the modelled areas were extracted from the Australian Bathymetry and Topography Grid, a 9 arc-second grid rendered for Australian waters (Whiteway 2009). Bathymetry data were re-gridded onto a Map Grid of Australia (MGA) coordinate projection (Zone 54) with a regular grid spacing of 250 × 250 m (Figure D-2, D-3 and D-4).

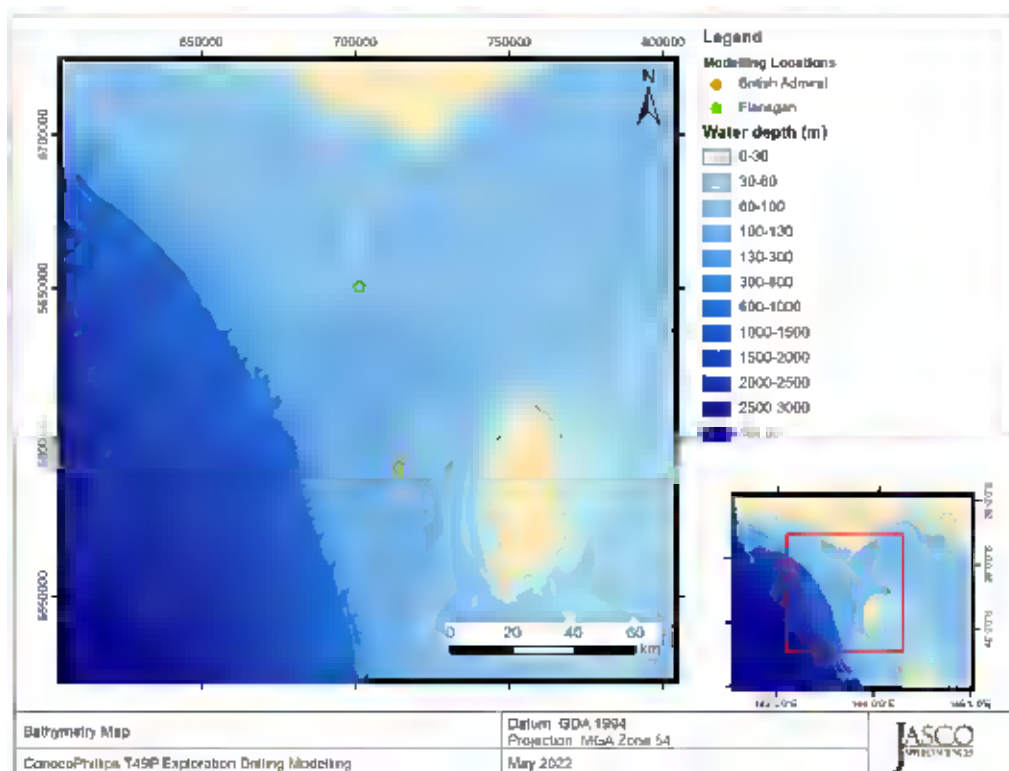


Figure D-2. Bathymetry in the T/49P modelled area.

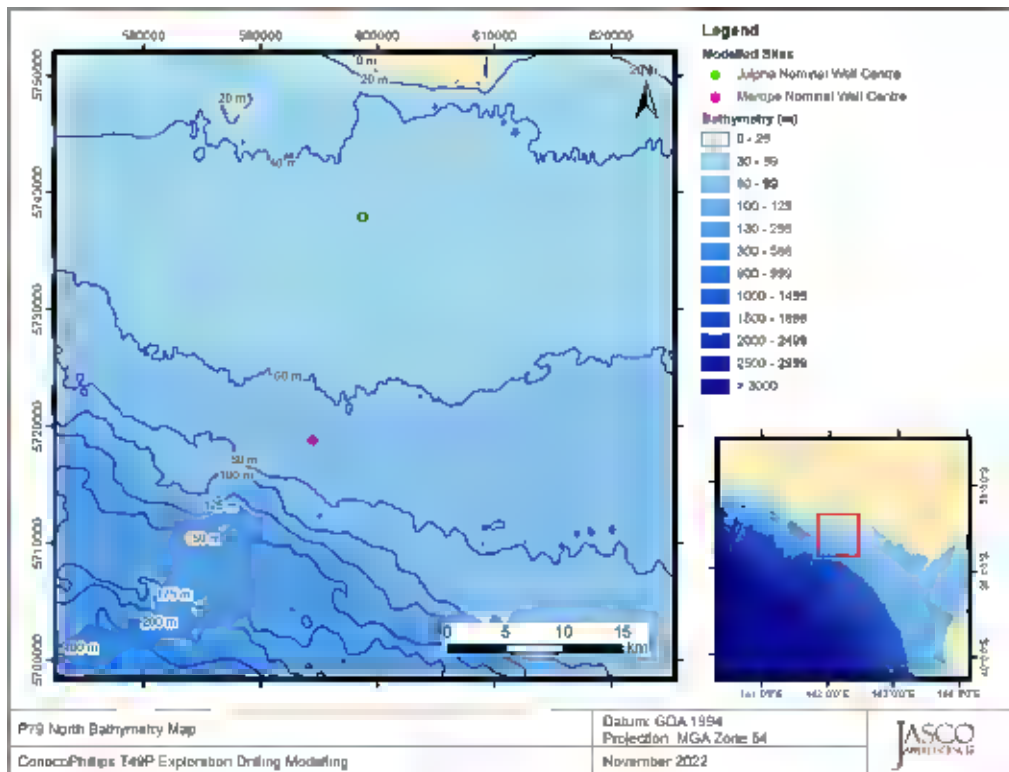


Figure D-3. Bathymetry in the northern extent of the VIC/P79 modelled area.

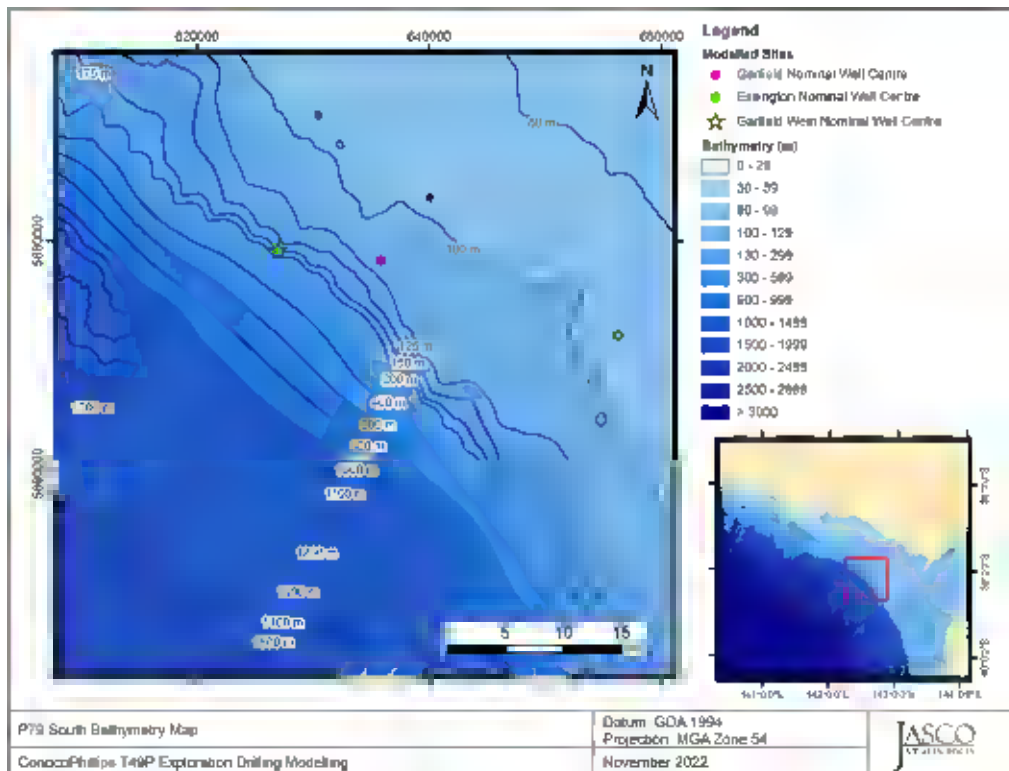


Figure D-4. Bathymetry in the southern extent of the VIC/P79 modelled area.

D.2.2. Sound Speed Profile

The sound speed profile in the area was derived from temperature and salinity profiles from the US Naval Oceanographic Office’s Generalized Digital Environmental Model V 3.0 (GDEM; Teague et al. 1990, Carnes 2009). GDEM provides an ocean climatology of temperature and salinity for the world’s oceans on a latitude-longitude grid with 0.25° resolution, with a temporal resolution of one month, based on global historical observations from the US Navy’s Master Oceanographic Observational Data Set (MOODS). The climatology profiles include 78 fixed depth points to a maximum depth of 6800 m (where the ocean is that deep). The GDEM temperature-salinity profiles were converted to sound speed profiles according to Coppens (1981).

Mean monthly sound speed profiles were derived from the GDEM profiles at distances less than 40 km around the modelled site. The July sound speed profile is expected to be most favourable to longer-range sound propagation across the entire year, and as such was selected for sound propagation modelling to ensure precautionary estimates of distances to received sound level thresholds. Figure D-5 shows the resulting profile, which was used as input to the sound propagation modelling as well as the other monthly profiles.

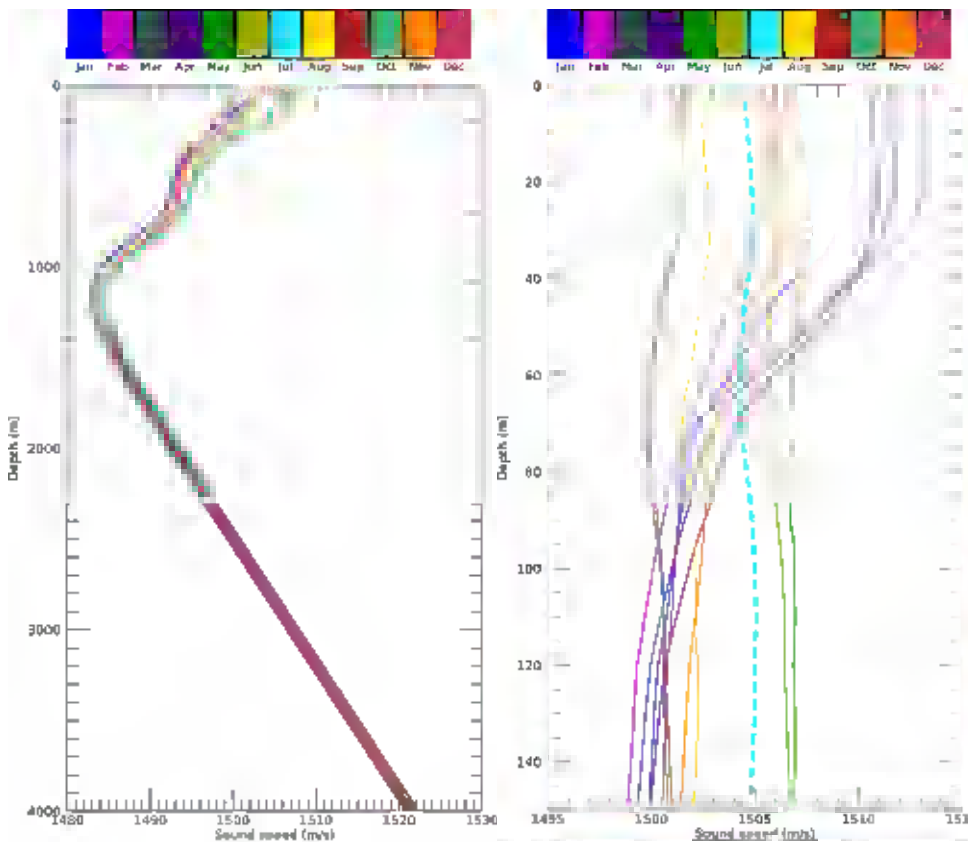


Figure D-5. The modelling sound speed profile corresponding to July (dashed curve) and (left) all full monthly profiles and (right) top 150 m. Profiles are calculated from temperature and salinity profiles from *Generalized Digital Environmental Model V 3.0* (GDEM; Teague et al. 1990, Carnes 2009).

D.2.3. Geoacoustics

Aside from *Garfield West*, a single representative geoacoustic profile was used for all other modelled sites based on borehole analysis near the modelling sites at the western edge of the Bass Strait

(Duncan et al. 2013). The sediment is typified by a thin layer of well-cemented calcarenite overlying a softer sand/calcarenite layer that extends for a further 100 m below the sea floor. The sound propagation models use a single value shear speed, which has been set at a value representative of the layers beneath the cemented calcarenite layer. The geoacoustic profile is presented in Table D-1.

Geoacoustic parameters used for modelling at *Garfield West* were derived from sedimentary grain size measurements from the Australian Government's Marine Sediments (MARS) database (Heap 2009). Most of these samples were taken on or near the seafloor, although some are from sediment at greater depths. On average, the surficial grain size indicates silty sand is present throughout the modelled area. Geotechnical data along the southern Australian shelf typically show sand overlaying calcarenite layers (Bradshaw 2002, Duncan et al. 2013). Representative grain sizes and porosity were used in the grain-shearing model proposed by Buckingham (2005) to estimate the geoacoustic parameters required by the sound propagation models. Table D-2 lists the geoacoustic parameters used for modelling.

Table D-1. Geoacoustic profile for all modelled sites. Each parameter remains constant within the stated range.

Depth below seafloor (m)	Predicted lithology	Density (g/cm ³)	Compressional wave		Shear wave	
			Speed (m/s)	Attenuation (dB/λ)	Speed (m/s)	Attenuation (dB/λ)
0–1	Well-cemented calcarenite	2.2	2600	0.2	500	0.4
1–101	Slightly to semi-cemented sand/calcarenite	1.9	2100	0.12		
101–1000	Semi-cemented sand/calcarenite	1.9	2200	0.12		
>1000	Basement (rock)	3.0	3800	0.1		

Table D-2. Geoacoustic profile for *Garfield West*. Each parameter changes linearly within the stated range.

Depth below seafloor (m)	Predicted lithology	Density (g/cm ³)	Compressional wave		Shear wave	
			Speed (m/s)	Attenuation (dB/λ)	Speed (m/s)	Attenuation (dB/λ)
0–10	Silty carbonate sand to semi-cemented limestone	1.88	1605–1700	0.35–0.70	255	3.65
10–20		1.88–1.89	1700–1755	0.70–0.85		
20–50		1.89–1.90	1755–1850	0.85–1.15		
50–100		1.90–1.92	1850–1950	1.15–1.35		
100–200		1.92–1.96	1950–2100	1.35–1.60		
200–500		1.96–2.05	2100–2355	1.60–1.95		
>500		1.88	1605–1700	0.35–0.70		

D.3. Estimating Range to Thresholds Levels

Sound level contours were calculated based on the underwater sound fields predicted by the propagation models, sampled by taking the maximum value over all modelled depths above the sea floor for each location in the modelled region. The predicted distances to specific levels were computed from these contours. Two distances relative to the source are reported for each sound level: 1) R_{max} , the maximum range to the given sound level over all azimuths, and 2) $R_{95\%}$, the range to the given sound level after the 5% farthest points were excluded (see examples in Figure D-6).

The $R_{95\%}$ is used because sound field footprints are often irregular in shape. In some cases, a sound level contour might have small protrusions or anomalous isolated fringes. This is demonstrated in the image in Figure D-6(a). In cases such as this, where relatively few points are excluded in any given direction, R_{max} can misrepresent the area of the region exposed to such effects, and $R_{95\%}$ is considered more representative. In strongly asymmetric cases such as shown in Figure D-6(b), on the other hand, $R_{95\%}$ neglects to account for significant protrusions in the footprint. In such cases R_{max} might better represent the region of effect in specific directions. Cases such as this are usually associated with bathymetric features affecting propagation. The difference between R_{max} and $R_{95\%}$ depends on the source directivity and the non-uniformity of the acoustic environment.

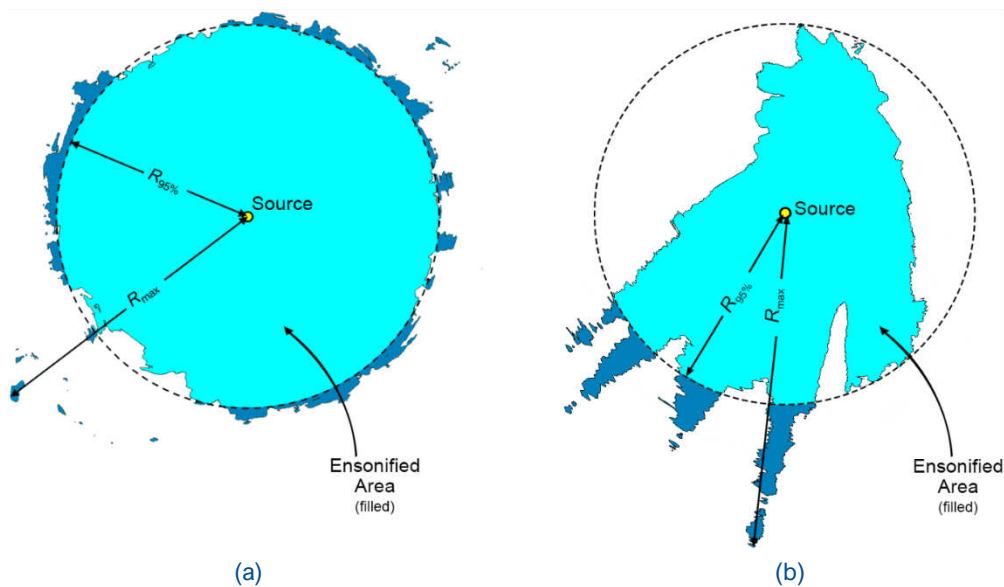


Figure D-6. Sample areas ensonified to an arbitrary sound level with R_{max} and $R_{95\%}$ ranges shown for two different scenarios. (a) Largely symmetric sound level contour with small protrusions. (b) Strongly asymmetric sound level contour with long protrusions. Light blue indicates the ensonified areas bounded by $R_{95\%}$; darker blue indicates the areas outside this boundary which determine R_{max} .

D.4. Estimating SPL from Modelled SEL Results

The per-pulse SEL of sound pulses is an energy-like metric related to the dose of sound received over a pulse's entire duration. The pulse SPL on the other hand, is related to its intensity over a specified time interval. Seismic pulses, and VSP pulses typically lengthen in duration as they propagate away from their source, due to seafloor and surface reflections, and other waveguide dispersion effects. The changes in pulse length, and therefore the time window considered, affect the numeric relationship between SPL and SEL. This study has applied a fixed window duration to calculate SPL ($T_{\text{fix}} = 125$ ms; see Appendix A.1), as implemented in Martin et al. (2017b). Full-waveform modelling was used to estimate SPL, but this type of modelling is computationally intensive, and can be prohibitively time consuming when run at high spatial resolution over large areas.

For the current study, FWRAM (see Appendix D.1.3) was used to model synthetic seismic pulses over the frequency range 5–1024 Hz. This was performed along select broadside and endfire radials at both drill site locations. FWRAM uses Fourier synthesis to recreate the signal in the time domain so that both the SEL and SPL from the source can be calculated. A 125 ms fixed time window positioned to maximise the SPL over the pulse duration was applied. The resulting SEL-to-SPL offsets were averaged in 0.01 km range bins along each modelled radial and depth, and the 90th percentile was selected at each range to generate a generalised range-dependent conversion function for the site. The range-dependent conversion function was then applied to predicted per-pulse SEL results from MONM to model and map SPL values.

The conversion offsets for the *British Admiral* and *Flanagan* sites are presented in; the spatial variation is caused by changes in the received airgun pulse as it propagates from the source.

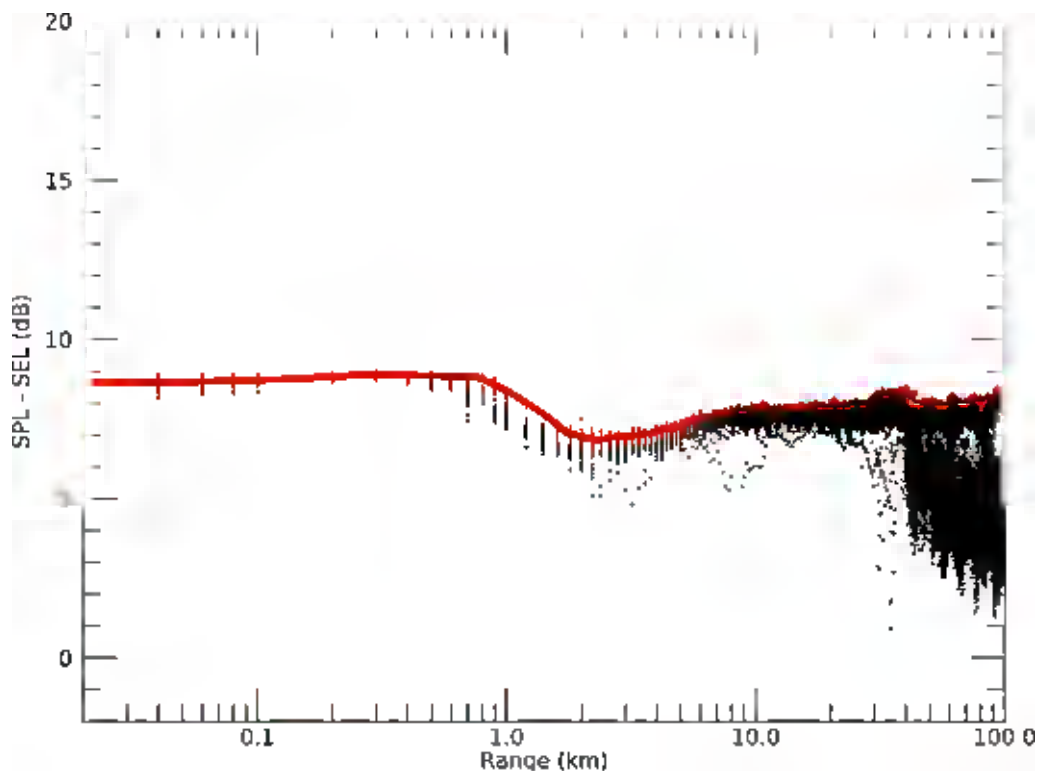


Figure D-7. Range-and-depth-dependent conversion offsets for converting sound exposure level (SEL) to sound pressure level (SPL) for Vertical Seismic Profiling (VSP) pulses at *British Admiral*. Black dots are the modelled differences between SEL and SPL across different radials and receiver depths; the solid red line is the 90th percentile of the modelled differences at each range.

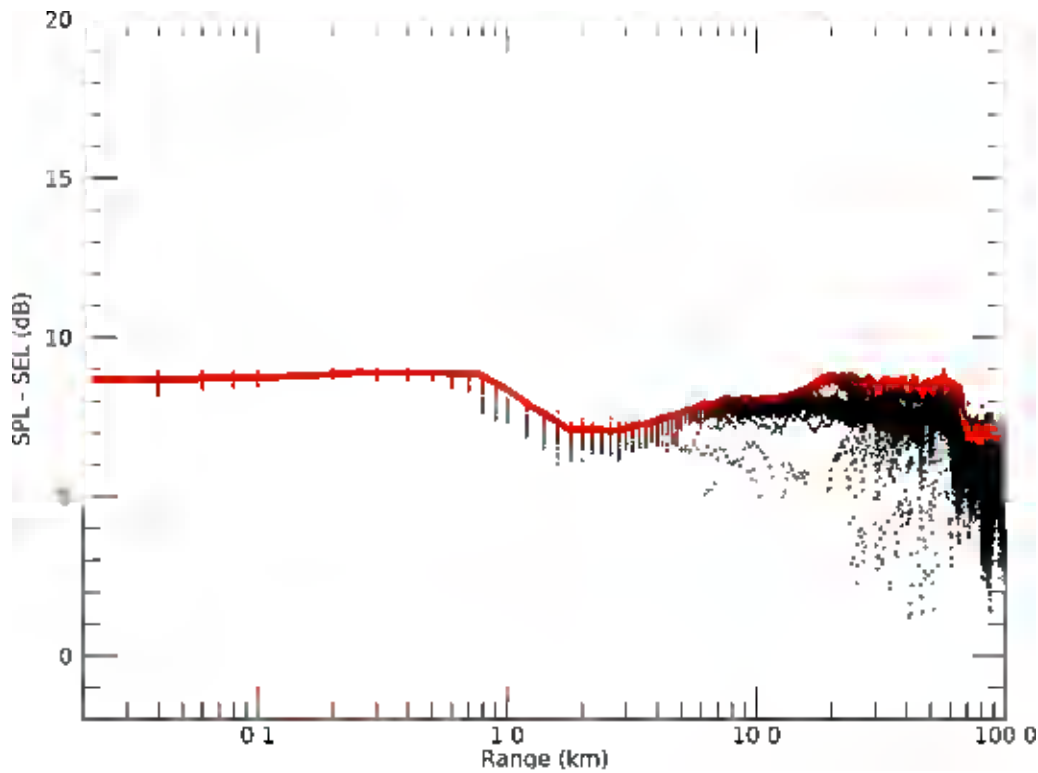


Figure D-8. Range-and-depth-dependent conversion offsets for converting sound exposure level (SEL) to sound pressure level (SPL) for Vertical Seismic Profiling (VSP) pulses at *Flanagan*. Black dots are the modelled differences between SEL and SPL across different radials and receiver depths; the solid red line is the 90th percentile of the modelled differences at each range.

D.5. Estimating Sound Field from Moving Vessels

During vessel transit, new sound energy is constantly introduced into the environment. The noise footprint for the transiting vessels considered in this report were estimated by modelling the 1 s SEL for the vessel at one location, and by translating and summing these footprints along the vessel transit routes. The vessel locations along the tracks were spaced uniformly, with an approximate step of $\Delta s \approx 100$ m.

The SEL sound field at any given point along the path is dependent on the exposure duration, which with a fixed footprint spacing depends on the speed of the vessel during each segment of the transit. The 1 s SEL footprint at each vessel location (*i*) were therefore scales based on the speed of the vessel following:

$$SEL_i = SEL_{1s} + 10 \log_{10} \left(\frac{\Delta s}{v} \right), \tag{D-2}$$

where *v* represents the vessel speed in m/s.

The present method acceptably reflects large-scale sound propagation features, primarily dependent on water depth, which dominate the cumulative field and is thus considered to provide a meaningful estimate of the SEL_{24h} field.

Appendix E. Model Validation Information

Predictions from JASCO's propagation models (MONM, FWRAM, and VSTACK) have been validated against experimental data from a number of underwater acoustic measurement programs conducted by JASCO globally, including the United States and Canadian Arctic, Canadian and southern United States waters, Greenland, Russia, and Australia (Hannay and Racca 2005, Aerts et al. 2008, Funk et al. 2008, Ireland et al. 2009, O'Neill et al. 2010, Warner et al. 2010, Racca et al. 2012a, Racca et al. 2012b, Matthews and MacGillivray 2013, Martin et al. 2015, Racca et al. 2015, Martin et al. 2017a, Martin et al. 2017b, Warner et al. 2017, MacGillivray 2018, McPherson et al. 2018, McPherson and Martin 2018).

In addition, JASCO has conducted measurement programs associated with a significant number of anthropogenic activities that have included internal validation of the modelling (including McCrodan et al. 2011, Austin and Warner 2012, McPherson and Warner 2012, Austin and Bailey 2013, Austin et al. 2013b, Zykov and MacDonnell 2013, Austin 2014, Austin et al. 2015, Austin and Li 2016, Martin and Popper 2016).

Appendix F. Tech Memo: Otway Exploration Drilling Program - Representative nature of Modelling Sites and Scenarios

F.1. Introduction

Underwater acoustic modelling scenarios were considered for the ConocoPhillips Australia Otway Exploration Drilling Program in both VIC/P79 (North and South) and T/49P and presented in a consolidated report:

- Otway Exploration Drilling Program: Acoustic Modelling for Assessing Marine Fauna Sound Exposures, Document 02760.

The locations of the modelling scenarios are shown in Figures 94, 95, 96, with increased detail on the drilling targets in T/49P shown in Figure 97. The modelling scenarios considered a range of scenarios encompassing all activities which might pose higher risks to marine fauna from underwater noise. The modelling results from all three reports relating to marine mammals, behavioural response and Temporary Threshold Shift (TTS) are summarised in Tables 46 and 47 respectively.

F.2. Modelling Results Analysis

To examine applicability of the modelling results across the drilling areas of interest, basic statistics were examined, and considered along with an understanding of how the geology and bathymetry influence the sound fields from the different operations. The statistical summary of the modelling results for behavioural response and TTS is presented in Table 48 and 49.

The general trend identified in the modelling results, and discussed in the modelling reports, is that for sites not immediately at the shelf edge (sites other than Garfield West), ranges to thresholds are generally consistent. This is due to both the bathymetry and the seabed geology, in particular the attenuating influence of the calcarenite seafloor. Close to the shelf break across the region the geology begins to change, resulting in a more reflective seabed, which when coupled with the down sloping bathymetry in the offshore direction, results in extended ranges to threshold(s) in the offshore direction.

The modelling results and associated trends indicate that it would be reasonable to represent the potential ranges to effect for drilling and associated operations within approximately the 110–125 m contour through using the presented results. Therefore, all potential drilling locations in T/49P within the operational area except for the very offshore boundary of Seal Rocks in two locations (near the canyon heads), as shown in Figure 97, can be represented through the presented results. For these two locations in the proximity to the shelf break increases; the proximity of the slope has an increased influence on the offshore propagation path, and the seabed increases in reflectivity, resulting in an increase in ranges to effect thresholds. However, this influence will gradually increase, and a conservative estimate of increases the maximum predicted ranges to effect by 125% is likely to be a valid representation of possible changes for these particular locations within Seal Rocks. For drilling locations within VIC/P79, the same reasoning is expected to apply, however no estimate is provided for potential ranges to thresholds deeper than the 150 m contour in VIC/P79.

F.3. Maps and Tables

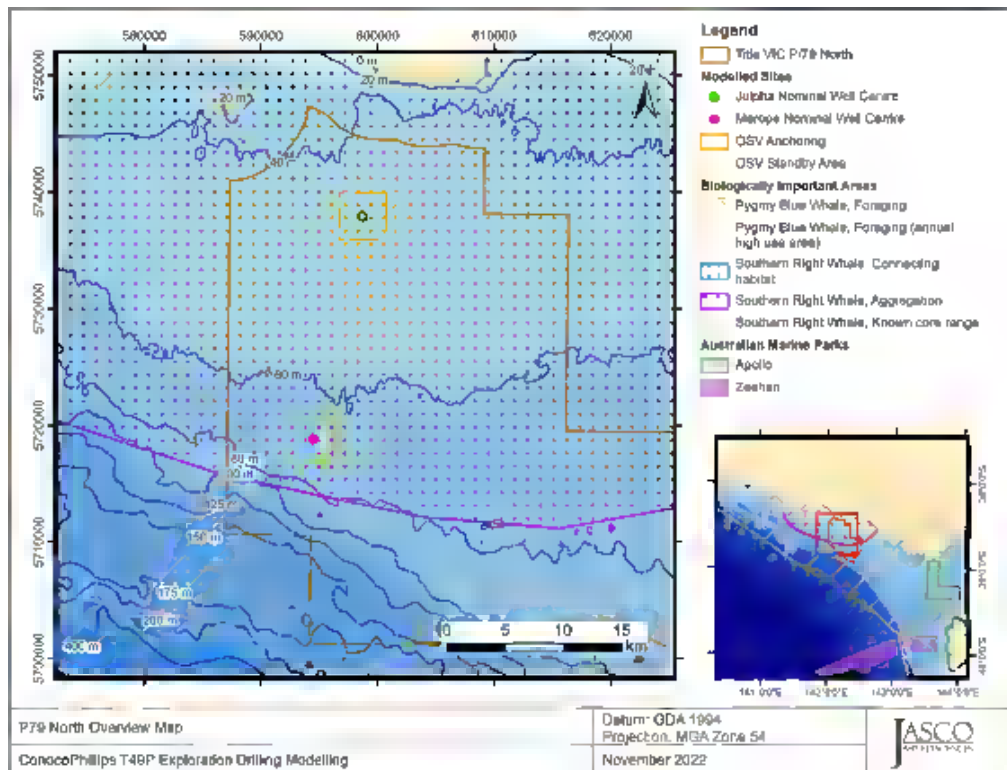


Figure 94. VIC/P79 Northern extent - Overview map of the Title and modelled sites.

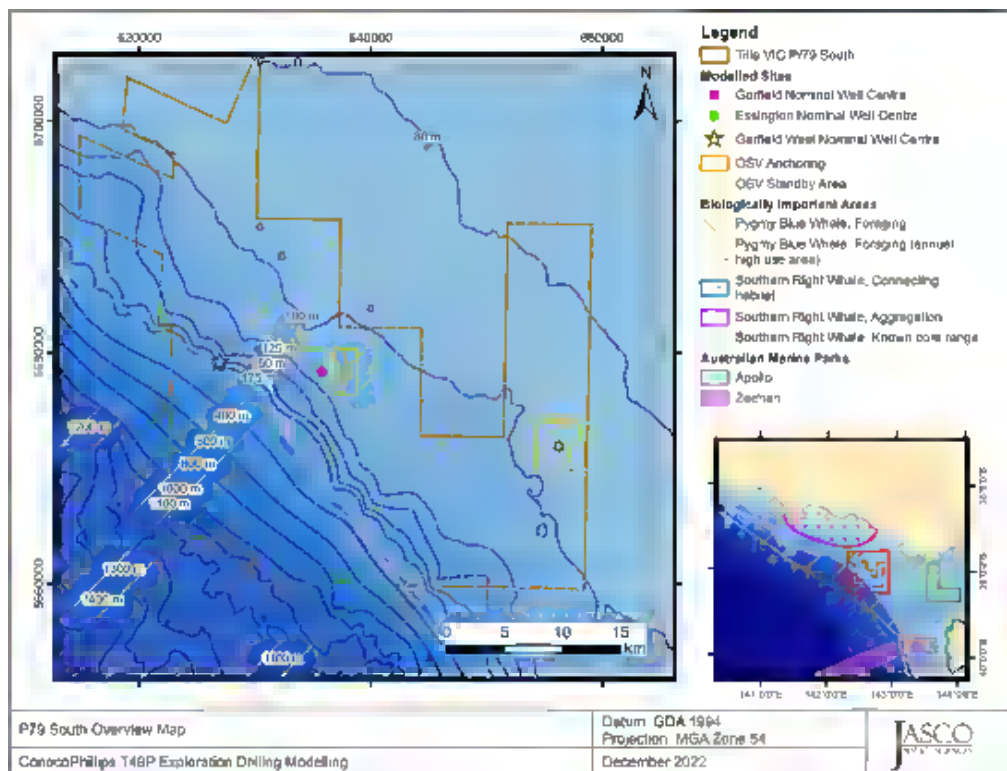


Figure 95. VIC/P79 Southern extent - Overview map of the Title and modelled sites.

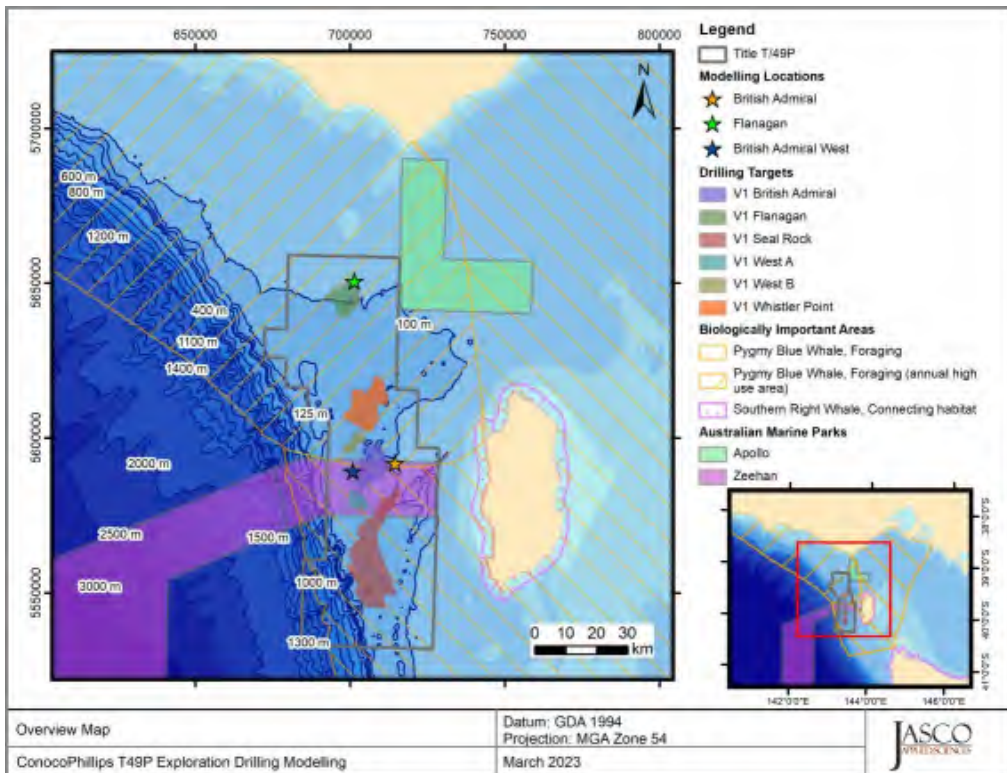


Figure 96. T/49P

Overview map of all drilling targets modelled within T/49P.

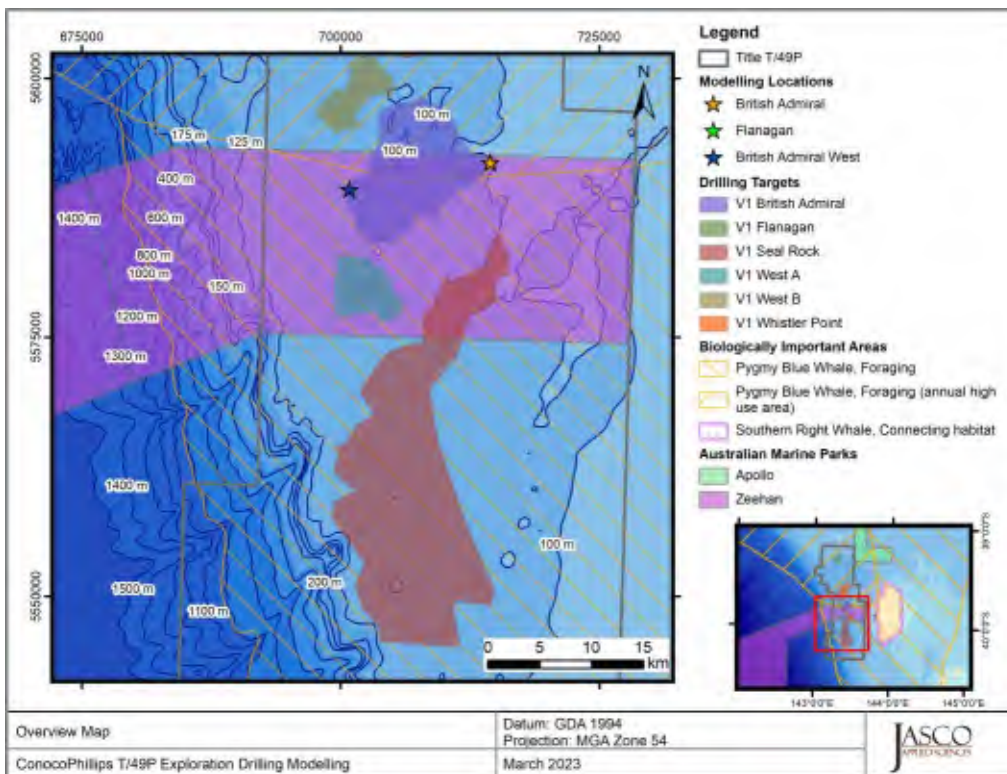


Figure 97. T/49P

- Overview map of southern drilling targets and modelling sites within T/49P.

Table 46. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to the marine mammal behavioural response criterion of 120 dB re 1 μ Pa (SPL) from the most appropriate location for considered sources per scenario.

Description	Merope (66 m depth)		Julpha (45 m depth)		Essington (93 m depth)		Garfield (110 m depth)		Garfield West (168 m depth)		British Admiral (102 m depth)		Flanagan (92 m depth)		British Admiral West (103 m depth)	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
Prelay: 1 × anchor handler working on site within 2 km of location	0.44	0.39	0.47	0.44	0.50	0.47	0.44	0.42	n/a	n/a	n/a	n/a	0.44	0.41	0.42	0.4
Mooring: Moored semi-sub idle (no noise); 1 × anchor handler on bridle on DP; 2 × anchor handlers working on site within 2 km of location	12.0	10.6	11.6	10.5	11.3	10.3	11.8	10.6	n/a	n/a	n/a	n/a	11.6	10.1	12.2	10.9
Drilling: Anchored MODU drilling	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.39	1.16	n/a	n/a	n/a	n/a	1.29	1.12
Drilling with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km	2.25	2.03	2.44	2.11	1.41	1.30	1.34	1.24	n/a	n/a	2.50	2.10	2.56	2.16	n/a	n/a
Drilling with resupply: Anchored MODU drilling; 1 × anchor handler at rig doing resupply (8 h)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22.8	18.9	n/a	n/a	n/a	n/a	10.0	9.13
Drilling, resupply, with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km; 1 × anchor handler at rig doing resupply (8 h)	12.6	10.8	12.2	10.9	11.4	10.4	12.0	10.9	n/a	n/a	11.4	10.4	12.0	10.9	n/a	n/a

DP: Dynamic Positioning, MODU: Mobile Offshore Drilling Unit

Table 47. Summary: Maximum (R_{max}) horizontal distances (in km) and ensonified area (km^2) for the frequency-weighted LF-cetacean SEL_{24h} temporary threshold shift (TTS) from the most appropriate location for the considered scenario.

Description	Merope (66 m depth)		Julpha (45 m depth)		Essington (93 m depth)		Garfield (110 m depth)		Garfield West (168 m depth)		British Admiral (102 m depth)		Flanagan (92 m depth)		British Admiral West (103 m depth)	
	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
Prelay: 1 × anchor handler working on site within 2 km of location	2.53	0.69	2.73	0.69	2.49	0.69	2.70	0.69	n/a	n/a	0.07	0.69	0.07	0.69	n/a	n/a
Mooring: Moored semi-sub idle (no noise); 1 × anchor handler on bridle on DP; 2 × anchor handlers working on site within 2 km of location	3.42	28.8	3.11	22.2	2.82	18.9	3.59	29.8	n/a	n/a	2.88	21.1	3.11	22.2	n/a	n/a
Drilling: Anchored MODU drilling	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.23	0.16	n/a	n/a	n/a	n/a	0.42	0.4
Drilling with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km	0.41	1.09	0.41	1.13	0.39	1.03	0.46	1.23	n/a	n/a	0.41	1.08	0.40	1.12	n/a	n/a
Drilling with resupply: Anchored MODU drilling; 1 × anchor handler at rig doing resupply (8 h)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.30	11.5	n/a	n/a	n/a	n/a	1.66	7.00
Drilling, resupply, with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km; 1 × anchor handler at rig doing resupply (8 h)	1.93	7.98	1.62	7.81	1.62	6.98	1.64	11.1	n/a	n/a	3.37	7.93	3.29	8.02	n/a	n/a

DP: Dynamic Positioning, MODU: Mobile Offshore Drilling Unit

Table 48. Statistics for Maximum (R_{max}) horizontal distances (in km) to the marine mammal behavioural response criterion of 120 dB re 1 μ Pa (SPL) for all results presented in Table 46.

Description	Minimum R_{max} (km)	Maximum R_{max} (km)	Mean R_{max} (km)
Prelay: 1 × anchor handler working on site within 2 km of location	0.42	0.5	0.45
Mooring: Moored semi-sub idle (no noise); 1 × anchor handler on bridle on DP; 2 × anchor handlers working on site within 2 km of location	11.3	12.2	11.75
Drilling: Anchored MODU drilling	1.29	1.39	1.34
Drilling with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km	1.34	2.56	2.08
Drilling with resupply: Anchored MODU drilling; 1 × anchor handler at rig doing resupply (8 h)	10	22.8	16.4
Drilling, resupply, with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km; 1 × anchor handler at rig doing resupply (8 h)	11.4	12.6	11.93

Table 49. Statistics for Maximum (R_{max}) horizontal distances (in km) to the frequency-weighted LF-cetacean SEL_{24h} temporary threshold shift (TTS) for all results presented in Table 47.

Description	Minimum R_{max} (km)	Maximum R_{max} (km)	Mean R_{max} (km)
Prelay: 1 × anchor handler working on site within 2 km of location	0.07	2.73	2.10
Mooring: Moored semi-sub idle (no noise); 1 × anchor handler on bridle on DP; 2 × anchor handlers working on site within 2 km of location	2.82	3.59	3.21
Drilling: Anchored MODU drilling	0.23	0.42	0.33
Drilling with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km	0.39	0.46	0.41
Drilling with resupply: Anchored MODU drilling; 1 × anchor handler at rig doing resupply (8 h)	1.66	2.3	1.98
Drilling, resupply, with standby vessel: Anchored MODU drilling; 1 × anchor handler on standby within 2 km; 1 × anchor handler at rig doing resupply (8 h)	1.62	3.37	2.25

Appendix G: Technical Memo

DATE: 7 October 2024

FROM: [REDACTED]

TO: [REDACTED]

DOCUMENT 03590

VERSION 1.0

Subject: Conoco Otway Exploration Drilling Modelling Update October 2024

1. Introduction

In 2022, JASCO Applied Sciences (Australia) performed a modelling study of underwater acoustic noise emissions associated with the ConocoPhillips VIC P/79 Exploration Drilling Campaign (Matthews et al. 2022). This modelling study considered a drilling campaign associated with the Julpha well. A change to the operational area has resulted in the need to re-model the Julpha activities at a new location within the revised operational area, henceforth referred to as the Boundary Site, due to its location on the boundary of the revised operational area.

This technical memo presents the results for acoustic modelling of vessel and drilling activities for the Boundary Site. All modelled sites, scenarios and tracks remain the same as for the original Julpha modelling, but shifted to the new Boundary Site location. Figure 1 displays the location of the Boundary Site and modelled site locations, and these are further detailed in Table 1. Table 2 summarises the modelling scenarios considered. All environmental parameters used within the modelling (including sound speed profile, geoacoustics and bathymetry file) are as per the original modelling. The only notable difference is that a revised broadband correction for propagation loss associated with the limestone seabed was applied that is relevant to the new modelling location (for full details, refer to Appendix D.1.5 in the original modelling report (Matthews et al. 2022)).

Another notable change since 2022 is the revision of the Southern Right Whale (SRW) BIAs. Previously the modelling area spanned SRW 'Aggregation' and 'Known Core Range' BIAs, whereas the revised BIAs brought into effect in 2023 comprise SRW 'Migration' and 'Reproduction' areas of interest. The Boundary Site lies within the SRW Migration BIA and approximately 18.7 km offshore of the closest extent of the SRW Reproduction BIA. As with the Julpha site, the Boundary Site lies within the pygmy blue whale Feeding BIA.

In addition to vessel and drilling activities, the original modelling report (Matthews et al. 2022) also included acoustic modelling of vertical seismic profiling (VSP) and boomer sub-bottom profiling (SBP). The ranges to threshold for these impulsive sources were relatively short when modelled at the Julpha site (maximum horizontal distances of 1 km for marine mammal temporary threshold shift (TTS), and

250 m for marine mammal permanent threshold shift (PTS)), and are not expected to differ at the Boundary Site, and have therefore not been remodelled.

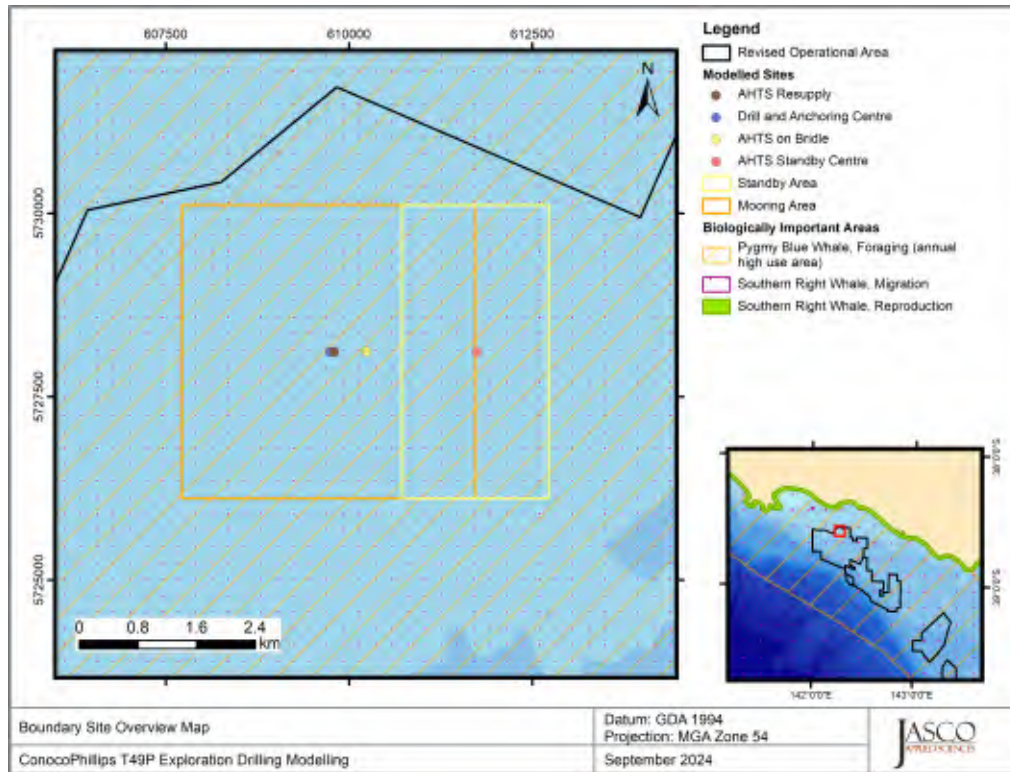


Figure 1. Boundary Site nominal well centre focused map showing drilling and vessel modelled features.

Table 1. Modelled site locations and source information.

Location	Site	Source(s)	Latitude (S)	Longitude (E)	MGA Zone 54 (GDA94)		Water depth (m)
					X (m)	Y (m)	
Boundary Site	MODU	<i>Ocean Onyx</i> (MODU)	38° 35' 19.04"	142° 15' 36.33"	609745	5728120	55
	Vessel at Bridle	Generic AHTS on Bridle DP	38° 35' 18.82"	142° 15' 56.99"	610245	5728120	55
	Resupply vessel	Generic AHTS under DP	38° 35' 19.07"	142° 15' 38.70"	609802	5728118	55
	2 km east of MODU	Generic AHTS in transit	38° 35' 18.14"	142° 16' 58.98"	611745	5728120	56
	2 km west of MODU	Generic AHTS in transit	38° 35' 19.92"	142° 14' 13.68"	607745	5728120	55

Table 2. Description of vessel modelling scenarios.

Scenario number	Site(s)		Source(s)	Description
	For computing SPL fields	For computing SEL fields		
1	Centre of 4 × 4 km box	Random locations (24 h) within 4 × 4 km box centred on MODU	Generic AHTS	Prelay: 1 × anchor handler working on site within 2 km of drilling location
2	Vessel at Bridle, 2 km east of MODU, and 2 km west of MODU	Vessel at Bridle (24 h), and 2 sets of random locations (24 h) within 4 × 4 km box centred on MODU	3 × Generic AHTS	Mooring: Moored Semi-sub idle (no noise) 1 × anchor handler on the bridle on DP 2 × anchor handlers working on site within 2 km of location
3	MODU, and 2 km east of MODU	MODU (24 h), and random locations (24 h) within 2 × 4 km box east of MODU	<i>Ocean Onyx</i> Generic AHTS	Drilling with standby vessel: Anchored MODU drilling 1 × anchor handler on standby ~2 km to the east
4	MODU, Resupply vessel, and 2 km east of MODU	MODU (24 h), Resupply vessel (8 h), and random locations (24 h) within 2 × 4 km box east of MODU	MODU 2 × Generic AHTS	Drilling, resupply, with standby vessel: Anchored MODU drilling 1 × anchor handler alongside MODU doing resupply (8 h) 1 × anchor handler on standby ~2 km to the east

2. Tabulated Results

Table 3 presents the maximum and 95% distances to SPL isopleths and thresholds at the Boundary Site drilling location. Table 4 presents the maximum distances to frequency weighted SEL_{24h} thresholds, as well as total ensonified area.

For the results below, the distances to isopleths/thresholds were reported from the most dominant single source. Maps are provided in Section 3 to assist in with contextualising tabulated distances.

Table 3. *Boundary Site, Vessel and drilling scenarios: Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to sound pressure level (SPL) isopleths and thresholds at all drilling locations. Scenario descriptions are given in Table 2.*

SPL (L_p ; dB re 1 μ Pa)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU+Standby vessel		Scenario 4: MODU+Supply +Standby vessels	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
180	–	–	–	–	–	–	–	–
170 ^a	–	–	–	–	–	–	–	–
160	–	–	0.10	0.10	–	–	0.10	0.10
158 ^b	–	–	0.13	0.13	–	–	0.13	0.13
150	–	–	0.47	0.45	0.03	0.03	0.47	0.45
140	0.03	0.03	1.06	0.91	0.12	0.12	1.06	0.92
130	0.14	0.14	3.78	3.30	0.66	0.54	3.52	3.19
120 ^c	0.58	0.56	10.9	8.81	2.23	2.00	11.3	9.18
110	1.08	1.03	30.3	26.5	5.51	4.74	29.0	26.2

^a 48 h threshold for recoverable injury for fish with a swim bladder involved in hearing (Popper et al. 2014).

^b 12 h threshold for TTS for fish with a swim bladder involved in hearing (Popper et al. 2014).

^c Threshold for marine mammal behavioural response to non-impulsive noise (NOAA 2019).

A dash indicates the threshold is not reached within the limits of the modelled resolution (20 m).

Table 4. *Boundary Site, vessel and drilling scenarios*: Maximum (R_{max}) horizontal distances (in km) to frequency-weighted SEL_{24h} permanent threshold shift (PTS) and temporary threshold shift (TTS) thresholds based on Southall et al. (2019) and Finneran et al. (2017) from the most appropriate location for considered sources per scenario, and ensonified area (km^2). Scenario descriptions are given in Table 2.

Hearing group	Frequency-weighted SEL_{24h} threshold ($L_{E,24h}$; dB re $1 \mu Pa^2 \cdot s$)	Scenario 1: Prelay		Scenario 2: Mooring		Scenario 3: MODU+Standby vessel		Scenario 4: MODU+Supply+Standby vessels	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS									
LF cetaceans	199	–	/	0.40	0.41	0.03	0.002	0.18	0.09
HF cetaceans	198	–	/	–	/	–	/	0.03	0.002
VHF cetaceans	173	–	/	0.16	0.08	0.23	0.15	0.26	0.18
Otariid pinnipeds in water	219	–	/	–	/	–	/	–	/
Sea turtles	220	–	/	–	/	–	/	–	/
TTS									
LF cetaceans	179	–	0.69	3.40	25.6	0.54	1.33	1.67	6.95
HF cetaceans	178	–	/	0.13	0.05	0.13	0.05	0.17	0.08
VHF cetaceans	153	–	0.003	0.97	2.81	1.32	4.21	1.36	5.38
Otariid pinnipeds in water	199	–	/	0.08	0.02	–	/	0.06	0.008
Sea turtles	200	–	/	0.33	0.29	–	/	0.14	0.06

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

A slash indicates that the area is less than an area associated with the modelled resolution (0.0013 km^2).

Table 5. Predicted received sound levels at the boundary of the Southern Right Whale reproductive BIA.

Boundary Site	SPL (dB re $1 \mu Pa$)			
	Scenario 1: Prelay	Scenario 2: Mooring	Scenario 3: MODU	Scenario 4: MODU+Supply vessel
Reproductive BIA boundary (X = 609172.0, Y = 5746788.7 (UTM zone 54S))	79.0	111.0	95.3	111.2

3. Sound Field Maps

Maps of the estimated sound fields, threshold contours, and isopleths of interest for SPL sound fields are presented for the Boundary Site scenarios in Figures 2 to 5.

3.1.1.1. Instantaneous SPL Sound level Contour Maps

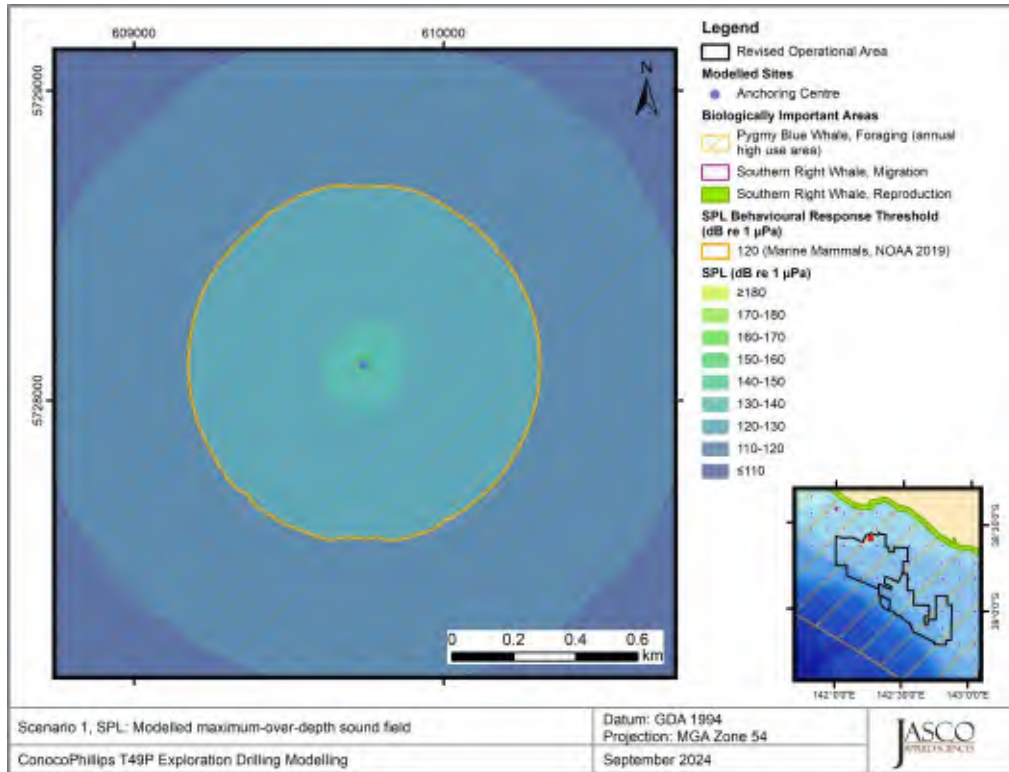


Figure 2. Scenario 1, Prelay — Boundary Site, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

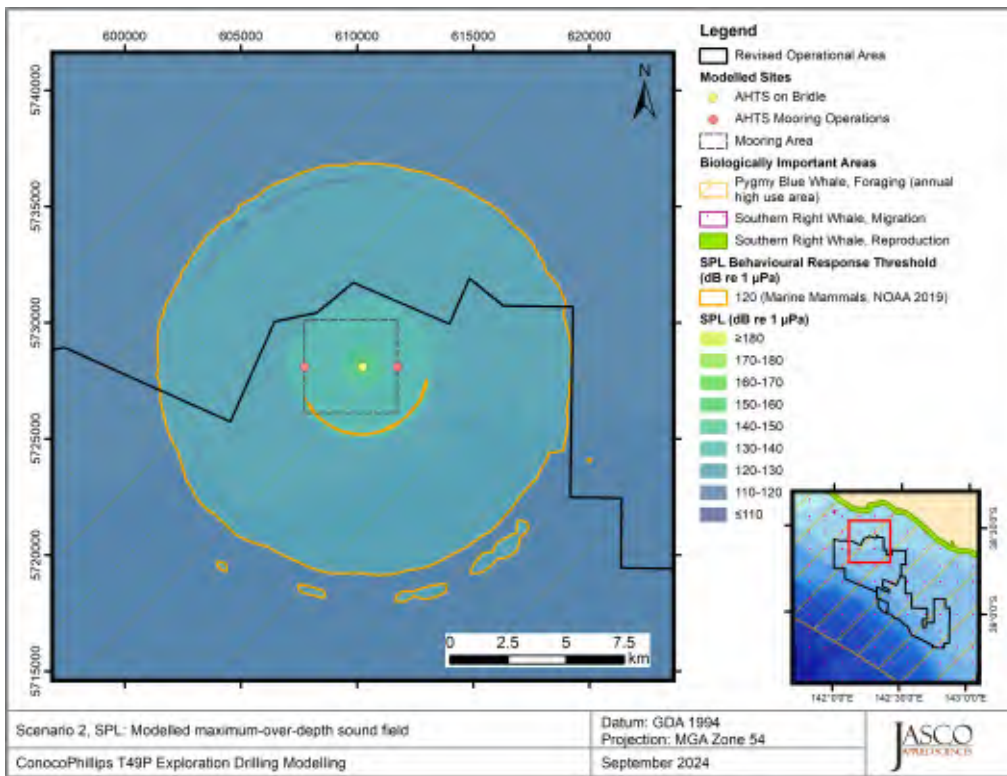


Figure 3. Scenario 2, Mooring — Boundary Site, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

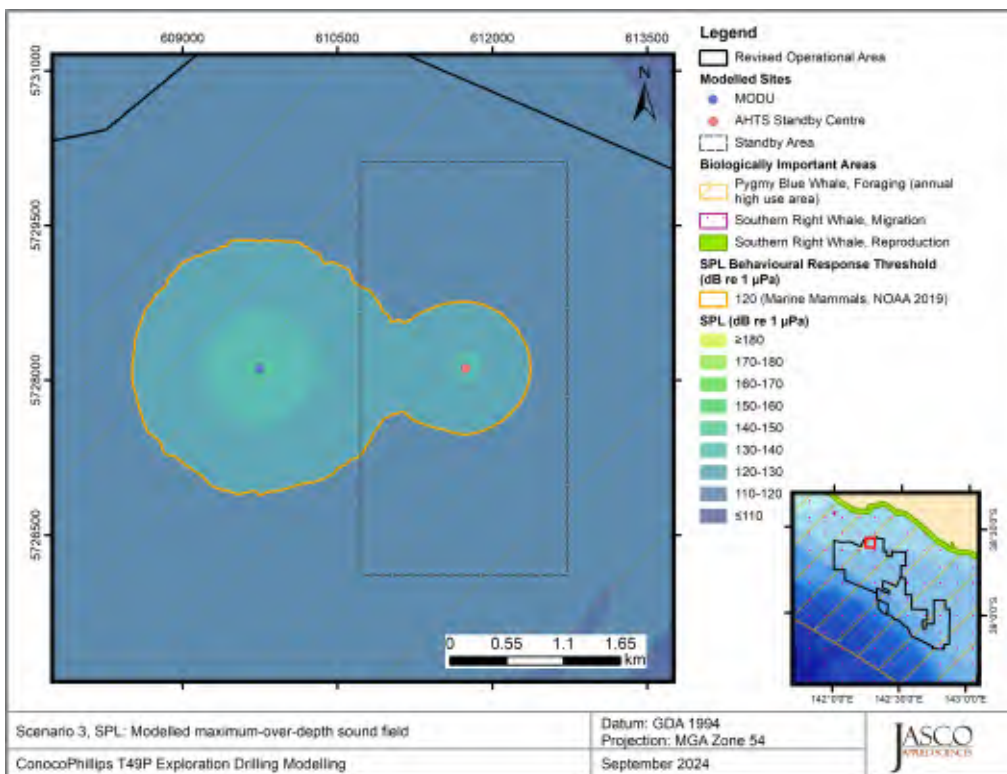


Figure 4. Scenario 3, Drilling with standby vessel — Boundary Site, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

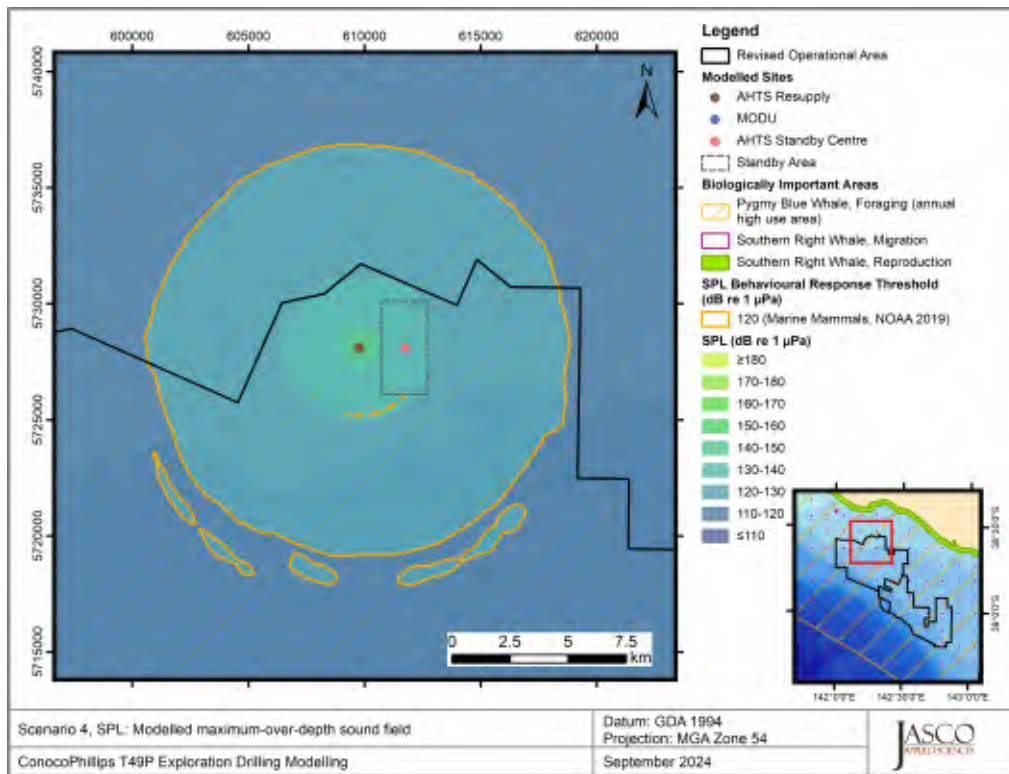


Figure 5. Scenario 4, Drilling, resupply and standby vessel — Boundary Site, SPL: Sound level contour map showing the unweighted maximum-over-depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

3.1.1.2. Accumulated 24 h Sound Fields

Maps of the estimated sound fields, threshold contours, and isopleths of interest for SEL_{24h} sound fields are presented for the Boundary Site scenarios in Figures 6 to 9.

Thresholds for permanent threshold shift (PTS) and some thresholds for TTS were either not reached, or were small enough such that they could not be displayed on a map. Refer to the radii tables in Section 2 for distances.

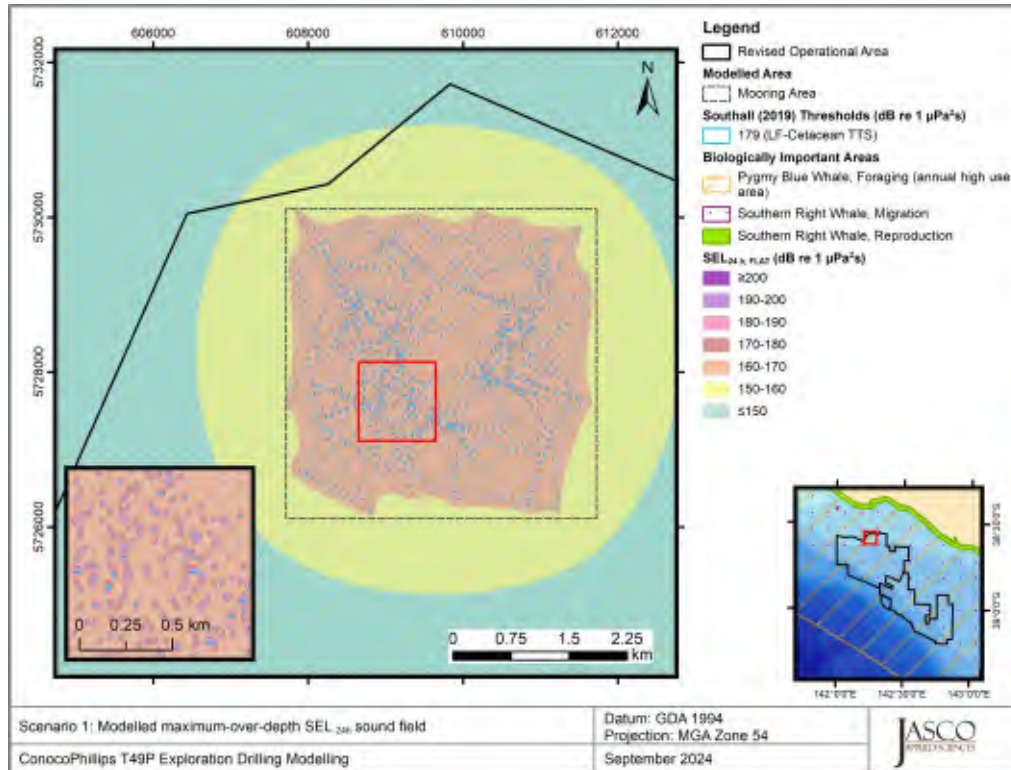


Figure 6. Scenario 1, Prelay — Boundary Site, SEL_{24h}: Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with frequency-weighted isopleths for temporary threshold shift (TTS) in low, high and very high-frequency cetaceans.

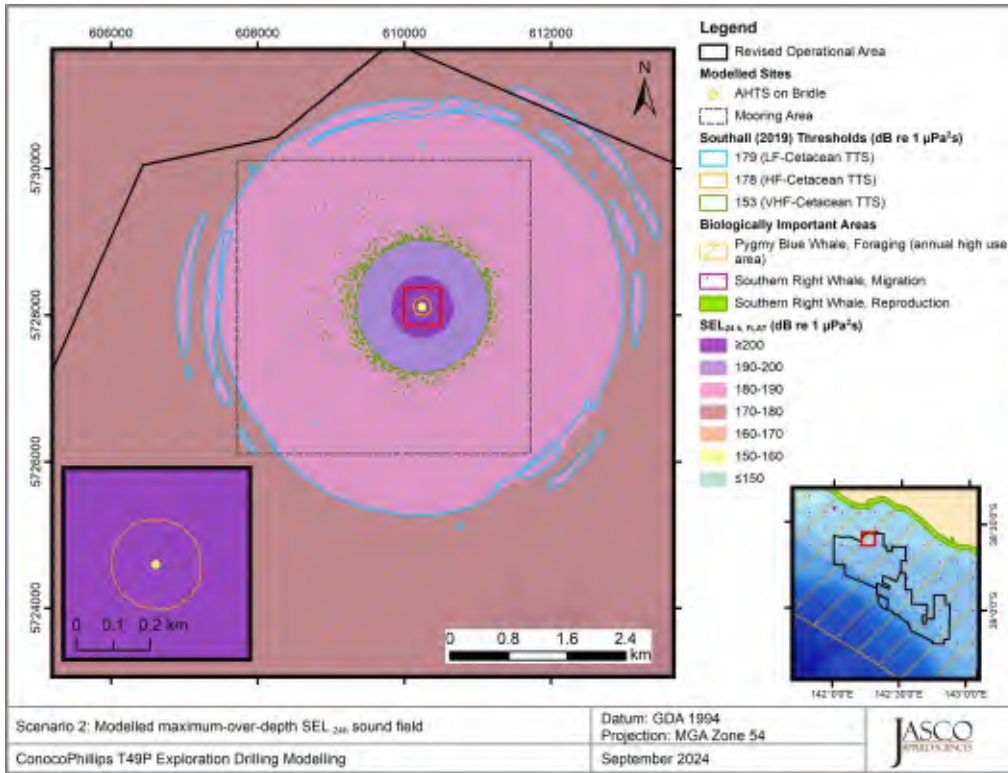


Figure 7. Scenario 2, Mooring — Boundary Site, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with frequency-weighted isopleths for temporary threshold shift (TTS) in low, high and very high-frequency cetaceans.

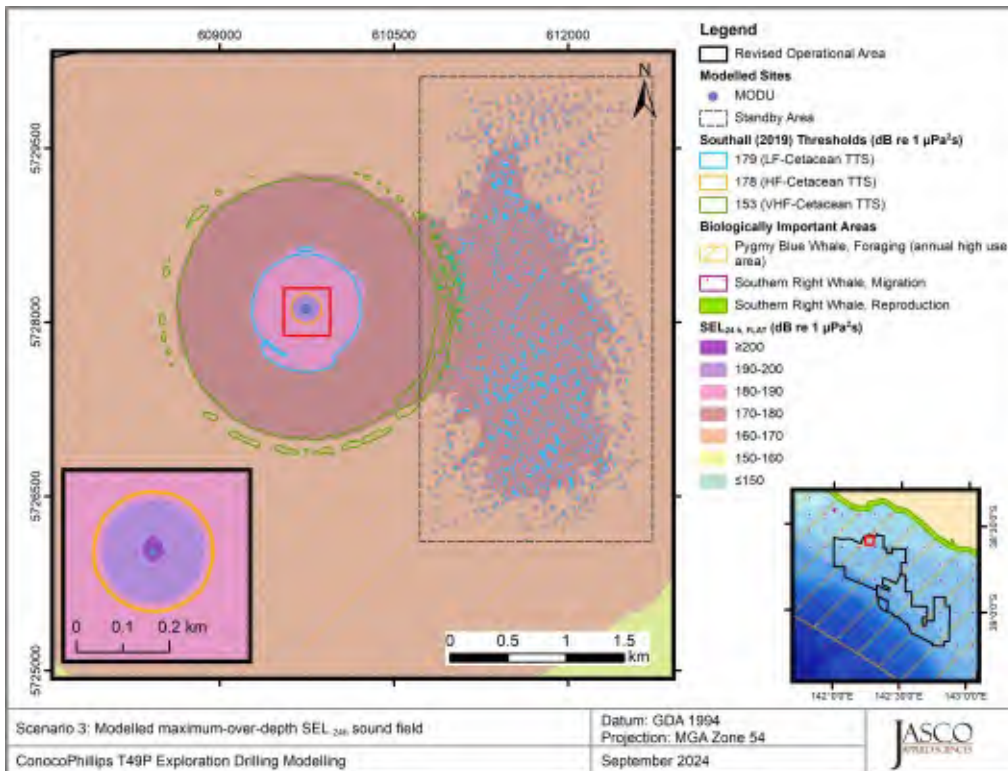


Figure 8. Scenario 3, Drilling with standby vessel — Boundary Site, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with frequency-weighted isopleths for temporary threshold shift (TTS) in low, high and very high-frequency cetaceans.

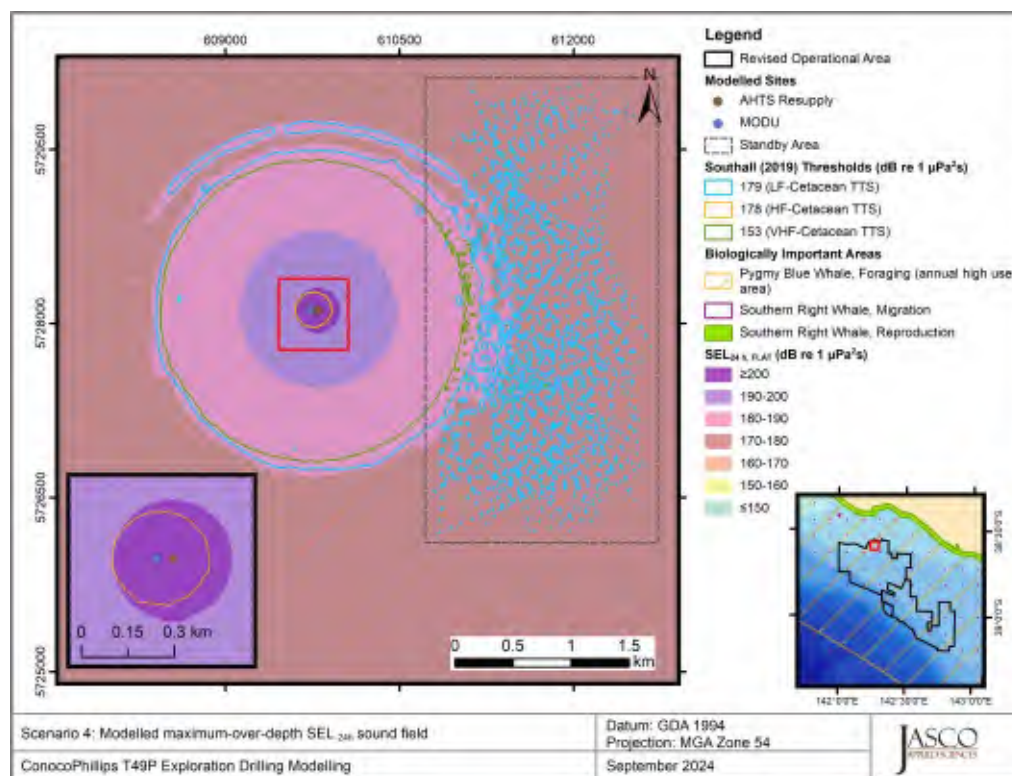


Figure 9. Scenario 4, Drilling, resupply and standby vessel — Boundary Site, SEL_{24h} : Sound level contour map showing unweighted maximum-over-depth SEL_{24h} results, along with frequency-weighted isopleths for temporary threshold shift (TTS) in low, high and very high-frequency cetaceans.

4. Literature Cited

- [NOAA] National Oceanic and Atmospheric Administration (US). 2019. *ESA Section 7 Consultation Tools for Marine Mammals on the West Coast* (web page), 27 Sep 2019. <https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/esa-section-7-consultation-tools-marine-mammals-west>.
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- Popper, A.N., A.D. Hawkins, R.R. Fay, D.A. Mann, S. Bartol, T.J. Carlson, S. Coombs, W.T. Ellison, R.L. Gentry, et al. 2014. *Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI*. ASA S3/SC1.4 TR-2014. SpringerBriefs in Oceanography. ASA Press and Springer. <https://doi.org/10.1007/978-3-319-06659-2>.
- Southall, B.L., J.J. Finneran, C.J. Reichmuth, P.E. Nachtigall, D.R. Ketten, A.E. Bowles, W.T. Ellison, D.P. Nowacek, and P.L. Tyack. 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals* 45(2): 125-232. <https://doi.org/10.1578/AM.45.2.2019.125>.

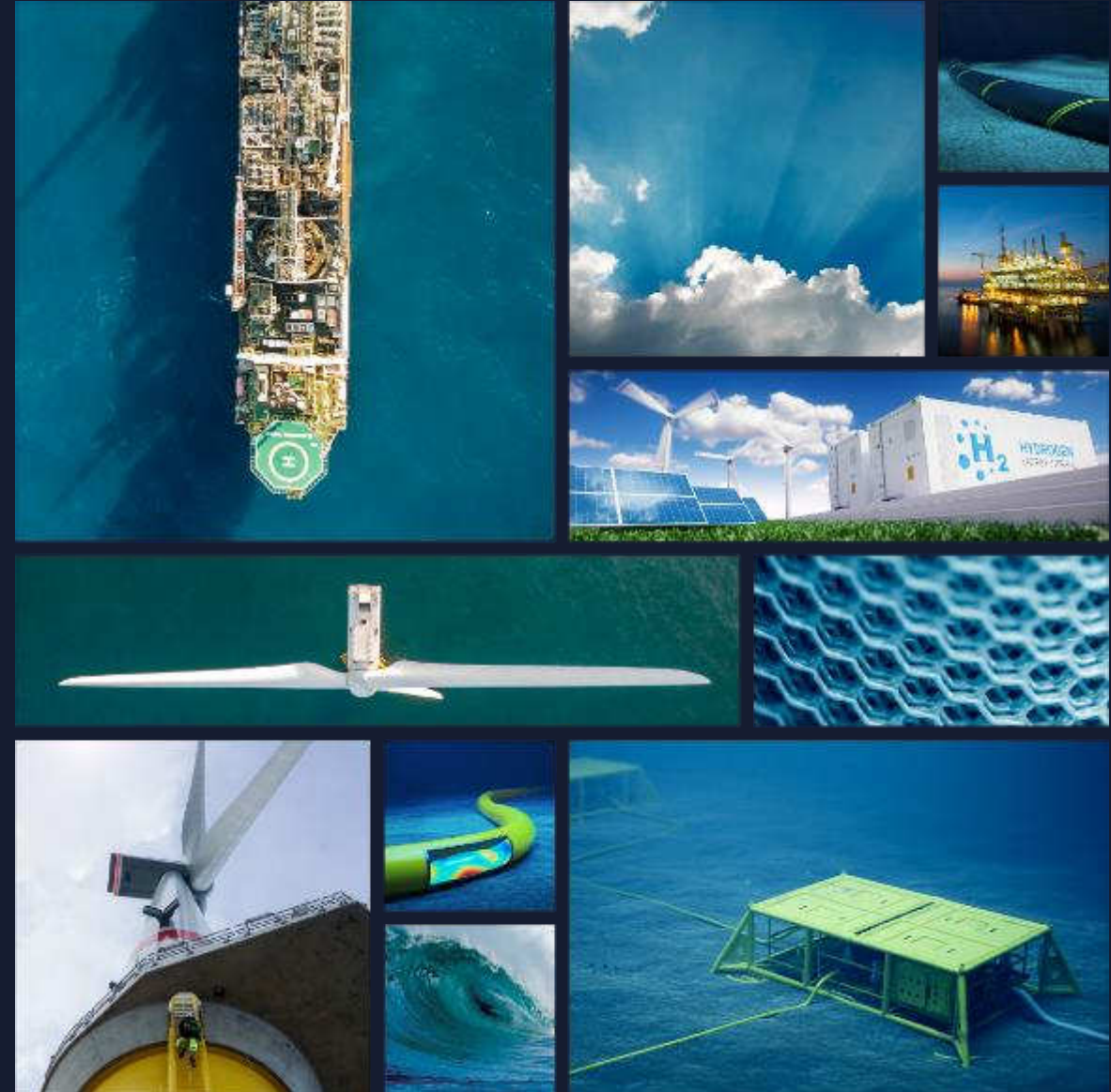
APPENDIX H ZTV MODELLING REPORTS



Zone of Theoretical Visibility (NORTH)

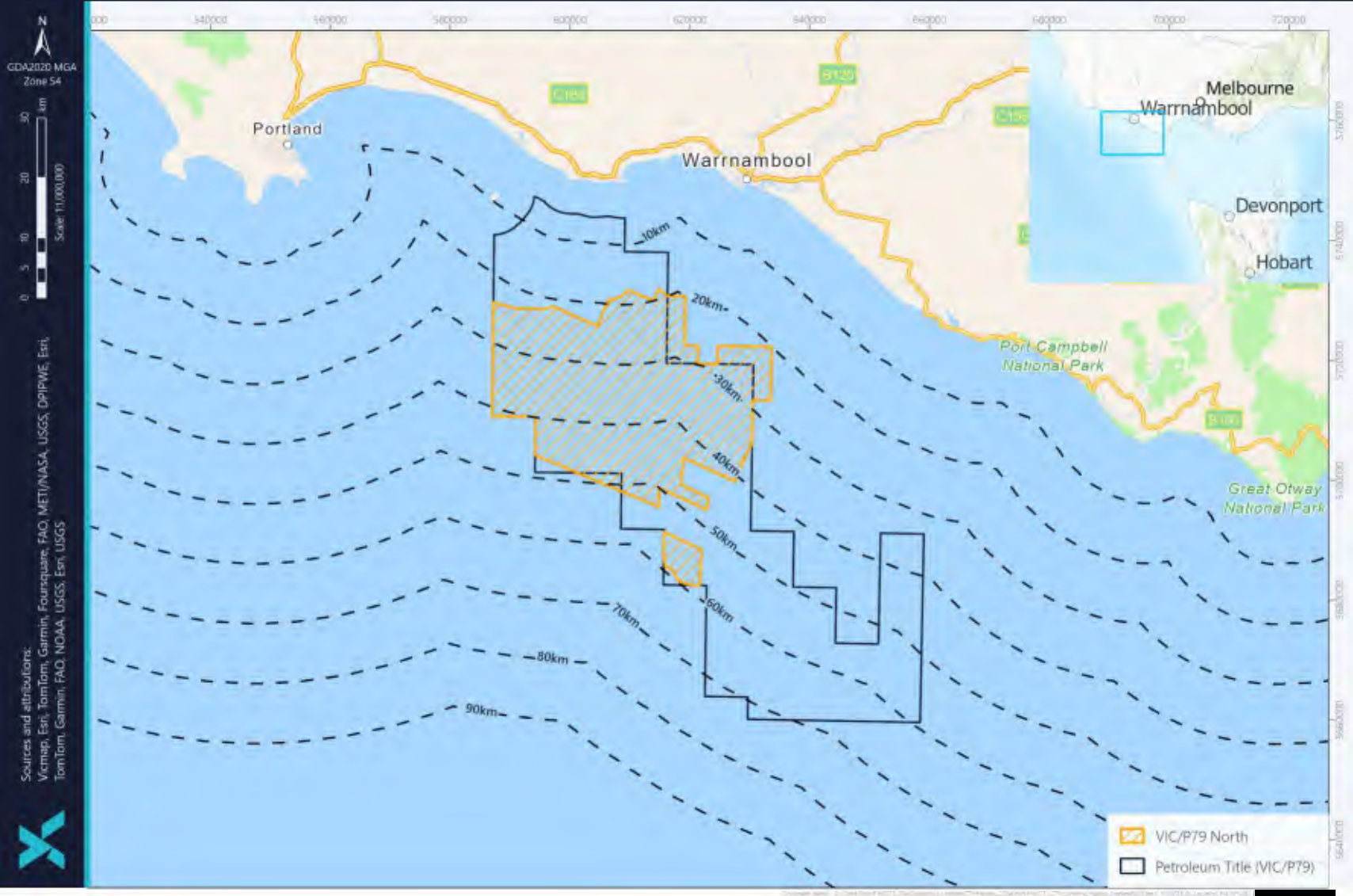
Geospatial visibility analysis of exploration activities within the northern extent of VIC/P79

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Target area VIC/P79 (North)



The Otway Basin is located along the southern coast of Victoria, west of Melbourne.

The objective of this technical note is to present the outcomes of the assessment undertaken to estimate the Visual Impact from the project.

The study assess visibility of a platform from selected viewing locations.



Otway Coast elevation and infrastructure



The elevation of the region is diverse.

Great Otway National Park to the east has a mountain range pushing elevations up into the 600-650m range.

Travelling north west from the national park, the terrain drops down into rolling hills and eventually flattens out into vast lower elevation agricultural plains.

There are several towns and one larger regional hub, Warrnambool.

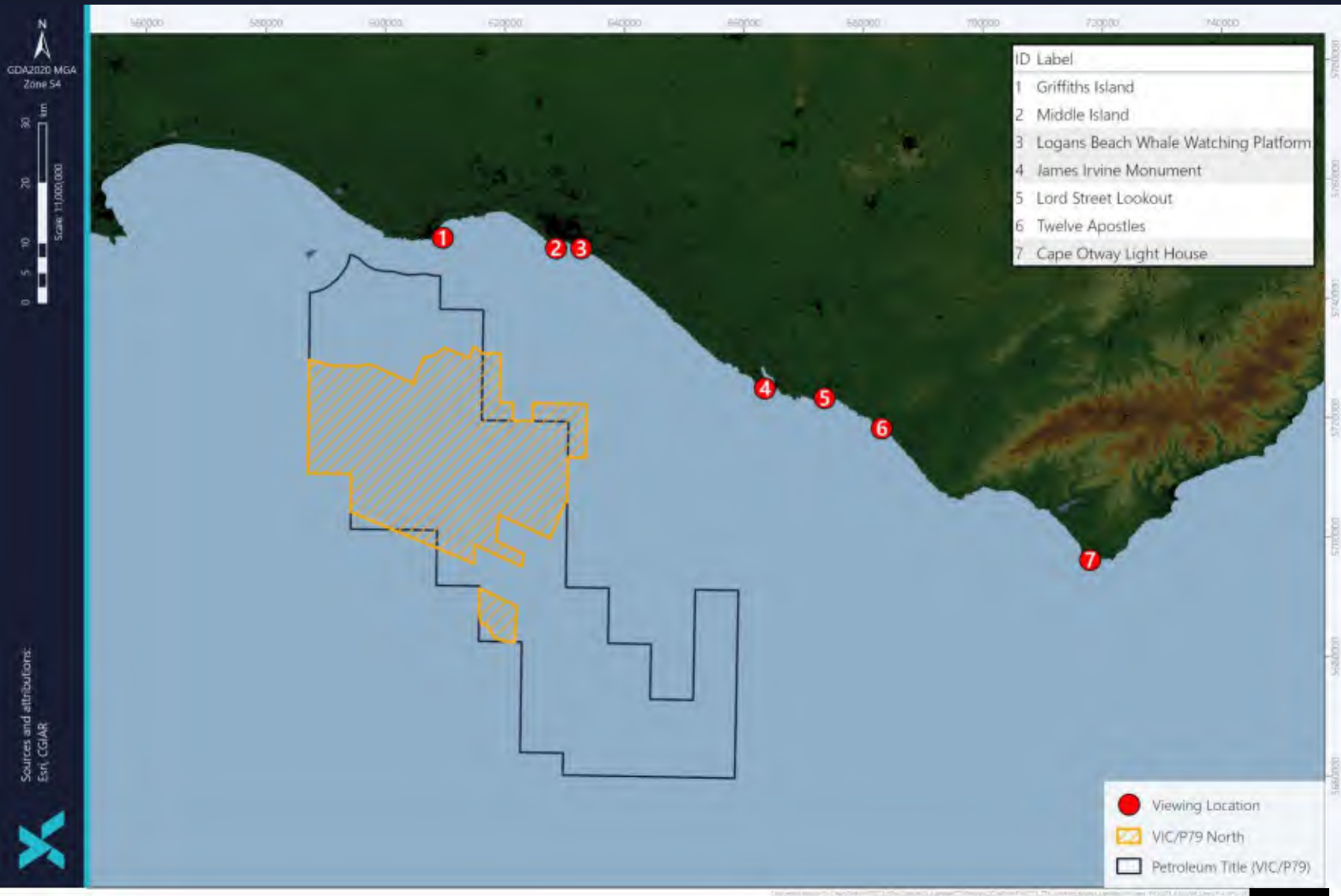
The coastline's unique geography/geology attracts tourists and therefore, has a series of viewing locations.

The Great Ocean Road tourism district (which includes this study area) attracted 7,038,000 people pre Covid-19 (2019).





Otway Coast viewing locations



For this study, seven locations were chosen based on the following factors:

1. Elevation
2. Visual access
3. Tourism amenity
4. Proximity to a point of interest

Griffiths Island

A tourism site at Port Fairy.

Middle Island

A prominent tourist attraction at Warrnambool with an elevated position for site seeing.

Logans Beach Whale Watching Platform

A prominent tourist attraction at Warrnambool with an elevated position for site seeing.

James Irvine Monument

A tourism site at Peterborough, has high visual amenity.

Lord Street Lookout

A tourism site at Port Campbell, has high visual amenity.

Twelve Apostles

A prominent tourist attraction with an elevated position for site seeing.

Cape Otway Light House

A tourism site with high visual amenity and elevated position.

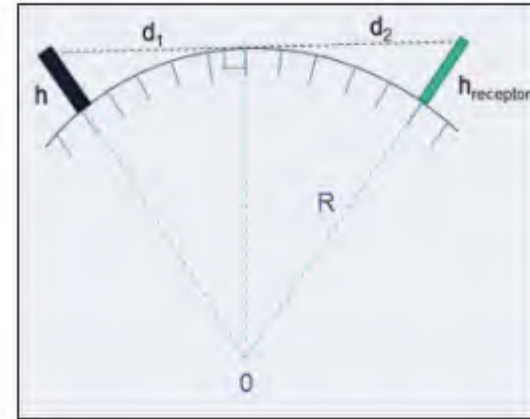


Line of sight calculation

$$d = \left(2 \cdot \frac{4}{3} R h_1 + h_1^2 \right)^{0.5} + \left(2 \cdot \frac{4}{3} R h_2 + h_2^2 \right)^{0.5}$$

Where

- h_1 = height of object
- h_2 = height of receptor
- R = radius of earth
- d = total line of sight ($d_1 + d_2$)



Line of sight and Viewshed analyses are conducted using the standard calculation above.

The calculation determines a viewers (h) visible horizon limit (d_1). And if applicable, the observable distance of an object (h_{receptor}) beyond the horizon ($d_1 + d_2$).

As elevation/height of an observer increases, so does the distance to the horizon. Likewise, the viewable distance of an object beyond the horizon increases with it's elevation/height.

This assumes no adverse atmospheric conditions or obstructed field of view.



Calculated viewshed

Label	Name	Elevation (m)	Horizon (km)	22 m Deck (km)	85 m Derrick (km)
1	Griffiths Island	3	7	27	45
2	Middle Island	14	15	35	53
3	Logans Beach Whale Watching Platform	20	18	38	56
4	James Irvine Monument	8	12	31	50
5	Lord Street Lookout	25	21	40	59
6	Twelve Apostles	43	27	46	65
7	Cape Otway Light House	91	39	59	77

These values represent the inputs (Elevation) and outputs (Horizon or Deck/Platform) of the calculated visibilities.

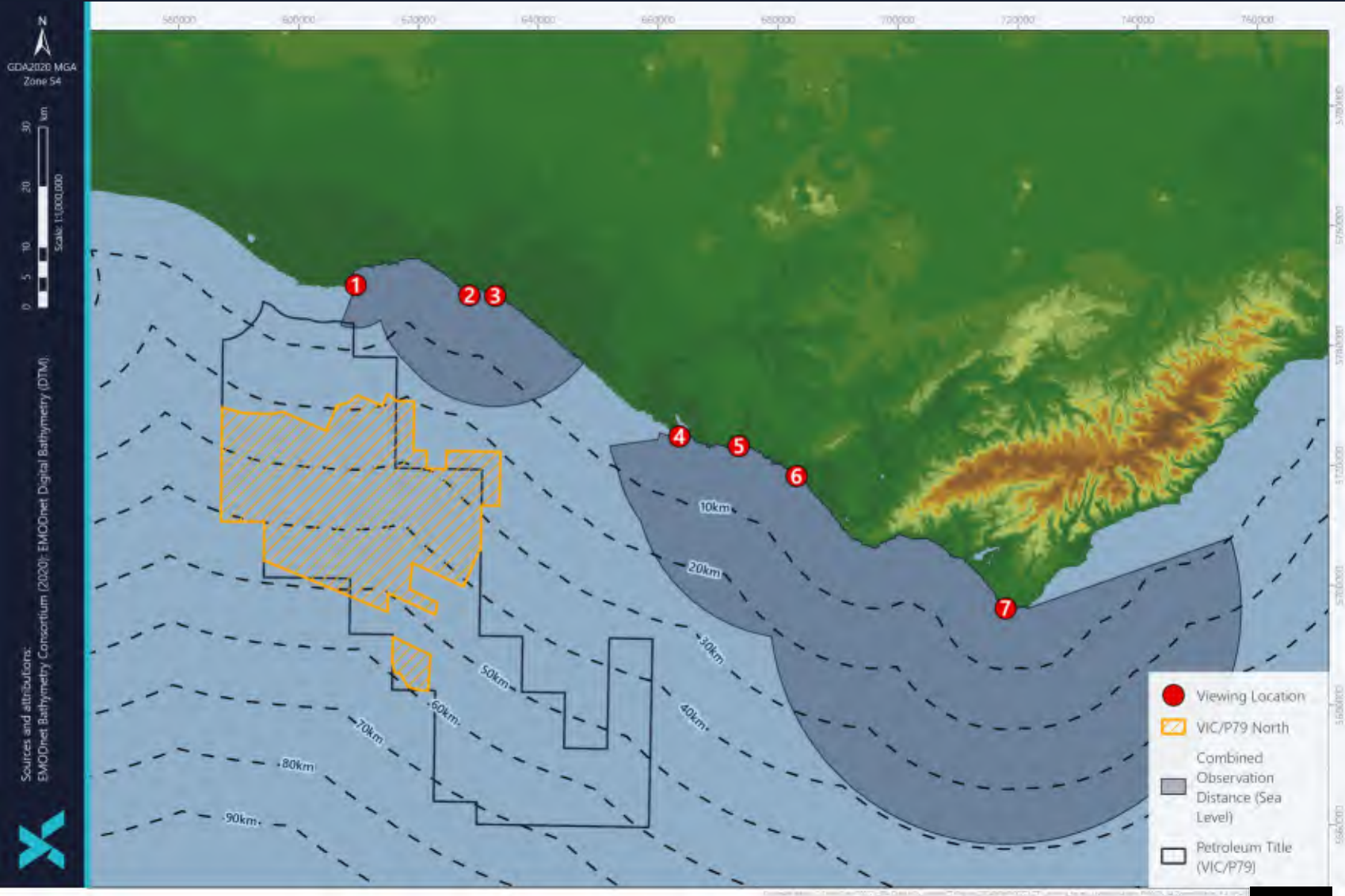
A 2 m tall observer at Griffiths Island (approximately 5 m above sea level) will see 39 km to the horizon. A 22 m high object will appear above the horizon to the observer up to 59 km away, and a 85 m high object will appear above the horizon up to 77 km away.

A main deck height of 22 m and worst case scenario derrick height of 85 m has been used in this study. These represent the likely heights .

Each location's elevation has had 2 m added as the elevation, to create the observers height.



Otway Basin viewshed for sea level horizon

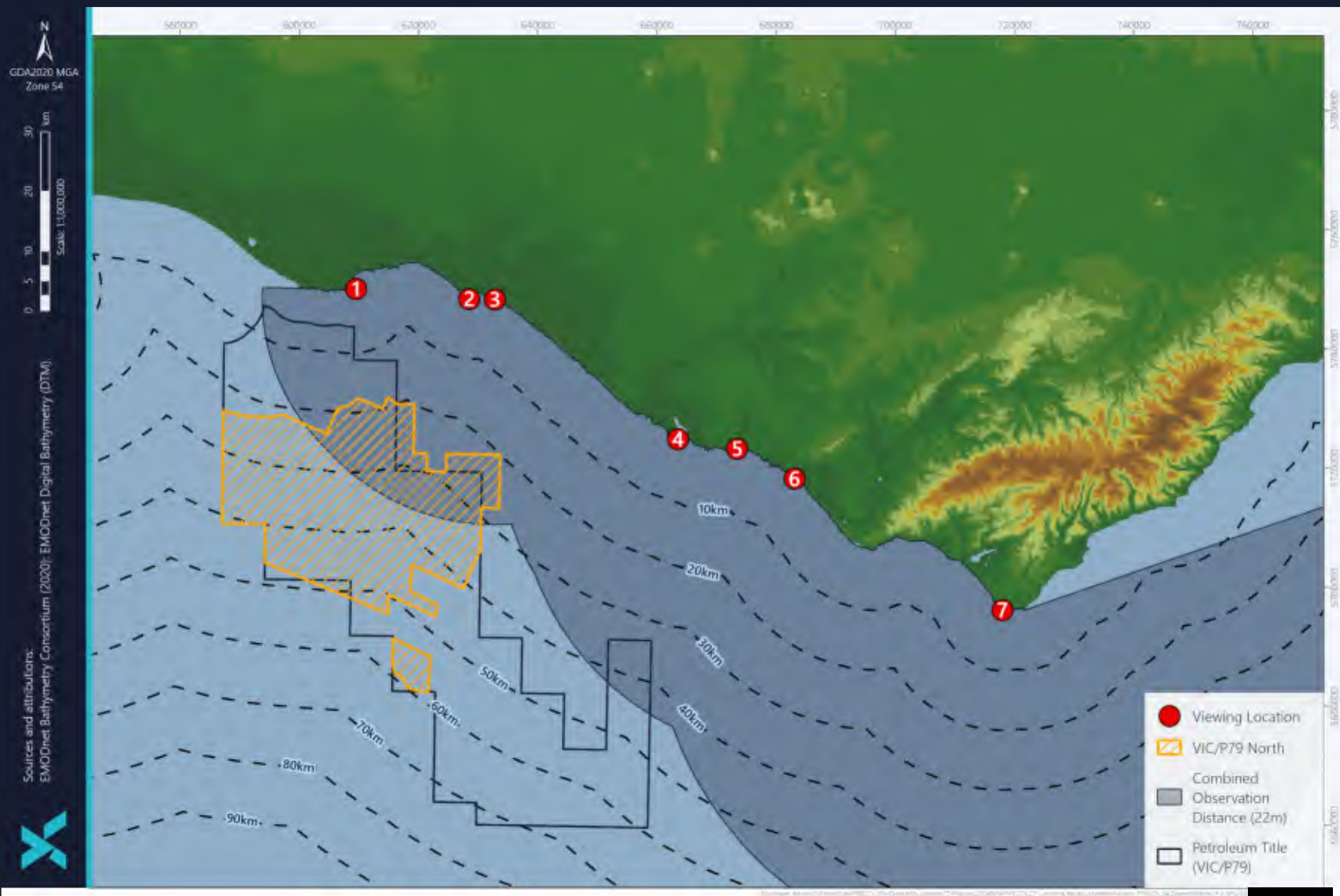


The fans of visibility (viewshed) represent the maximum viewable area from each location. As is demonstrated, the areas are dissected by local obstructions (islands and other landforms).

The permit area (at sea level) is not visible from any viewing location.



Otway Basin viewshed for 22 metre high object

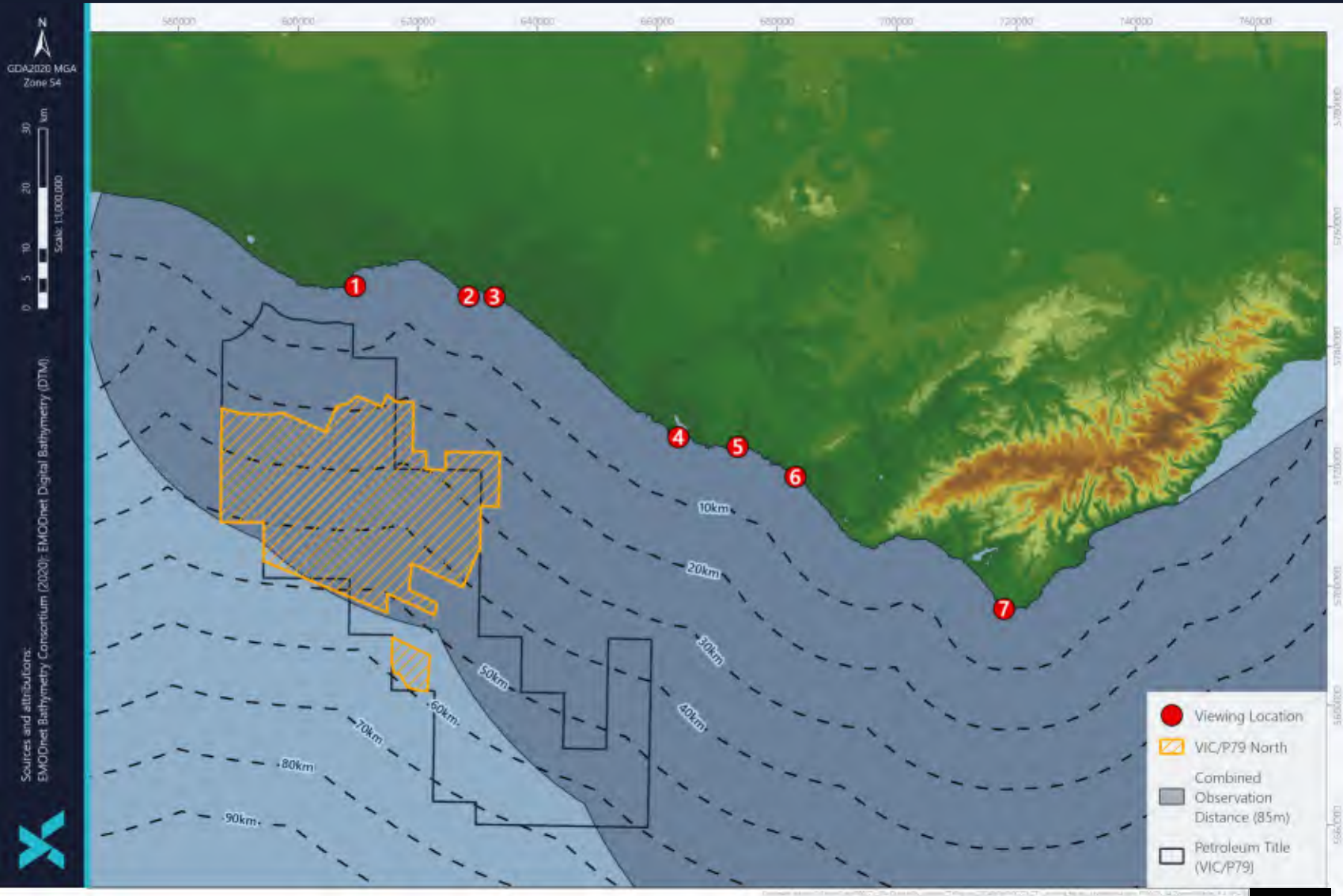


The fans of visibility represent the maximum viewable area of a 22 m high deck from each location.

The majority of the permit area can host a 22 m high deck without visual impact.



Otway Basin Viewshed for 85 m high object



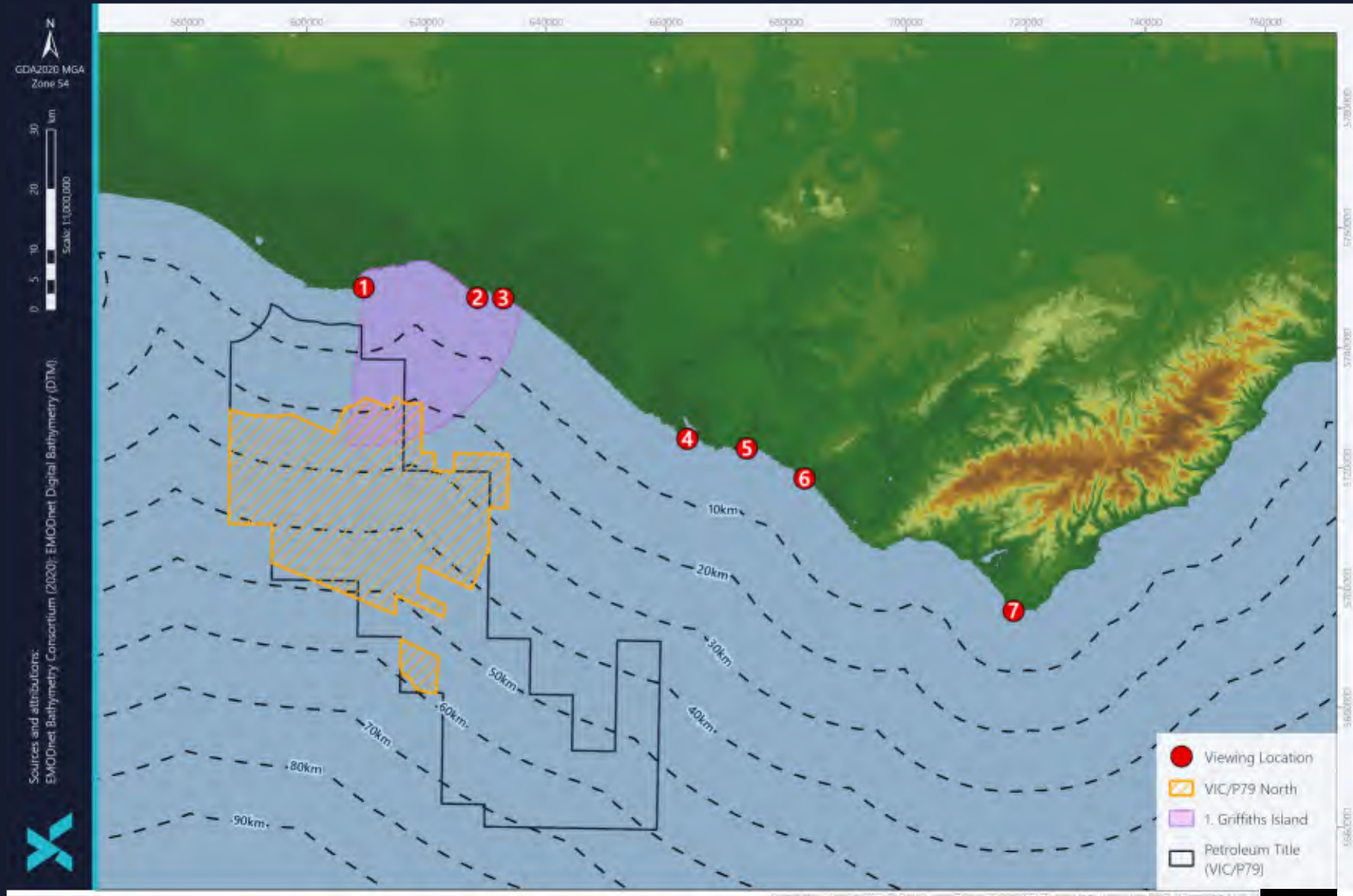
The fans of visibility represent the maximum viewable area of a 85 m high platform from each location.

A 85 m high derrick will be visible from the western most viewing sites, and likely not visible from the eastern most (see individual viewshed images).

Very little of the permit area can host a 85 m high derrick that is not visible from at least one of the viewing sites.

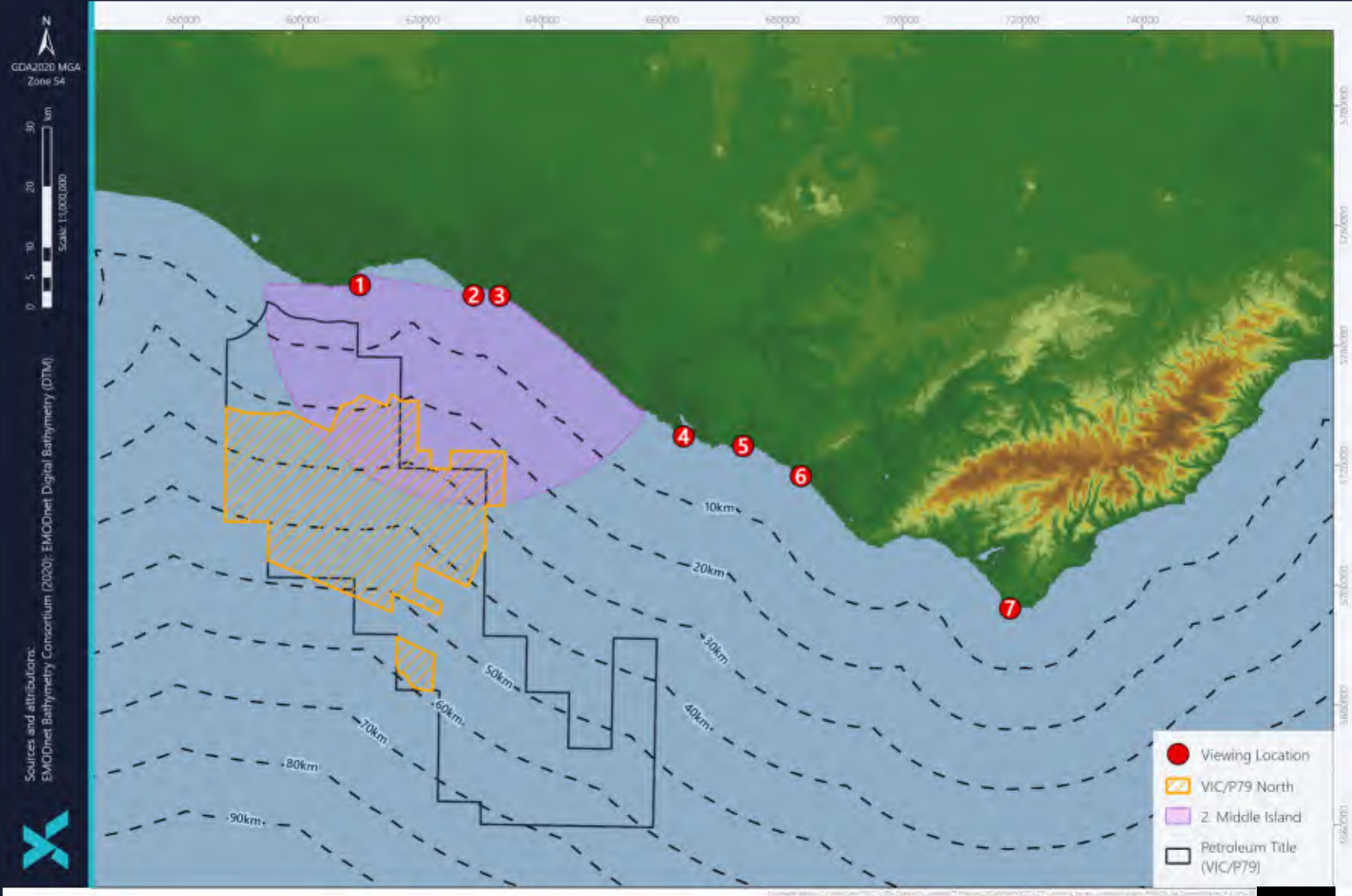


Site 1 viewshed for 22 m high object



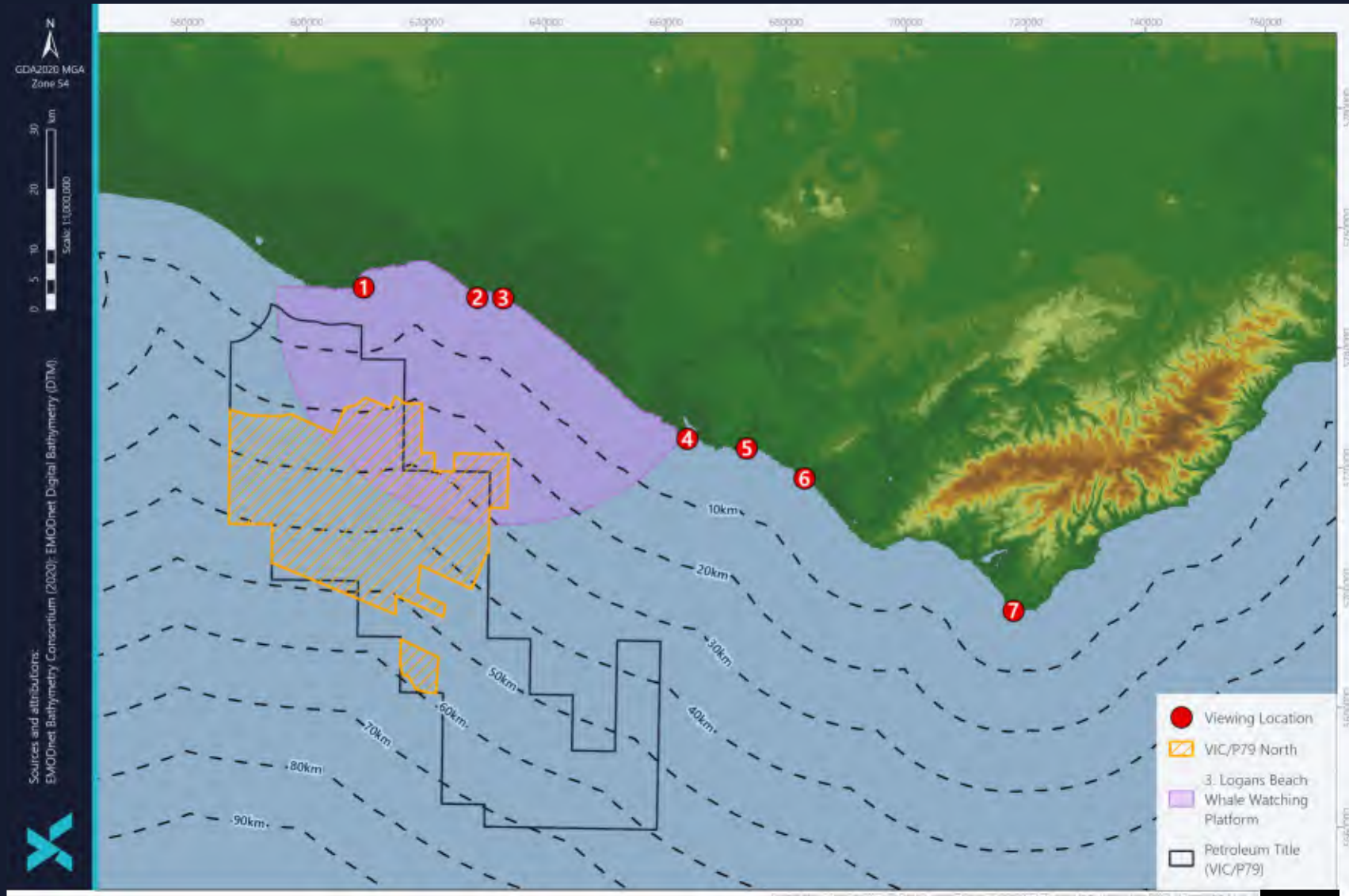


Site 2 viewshed for 22 m high object



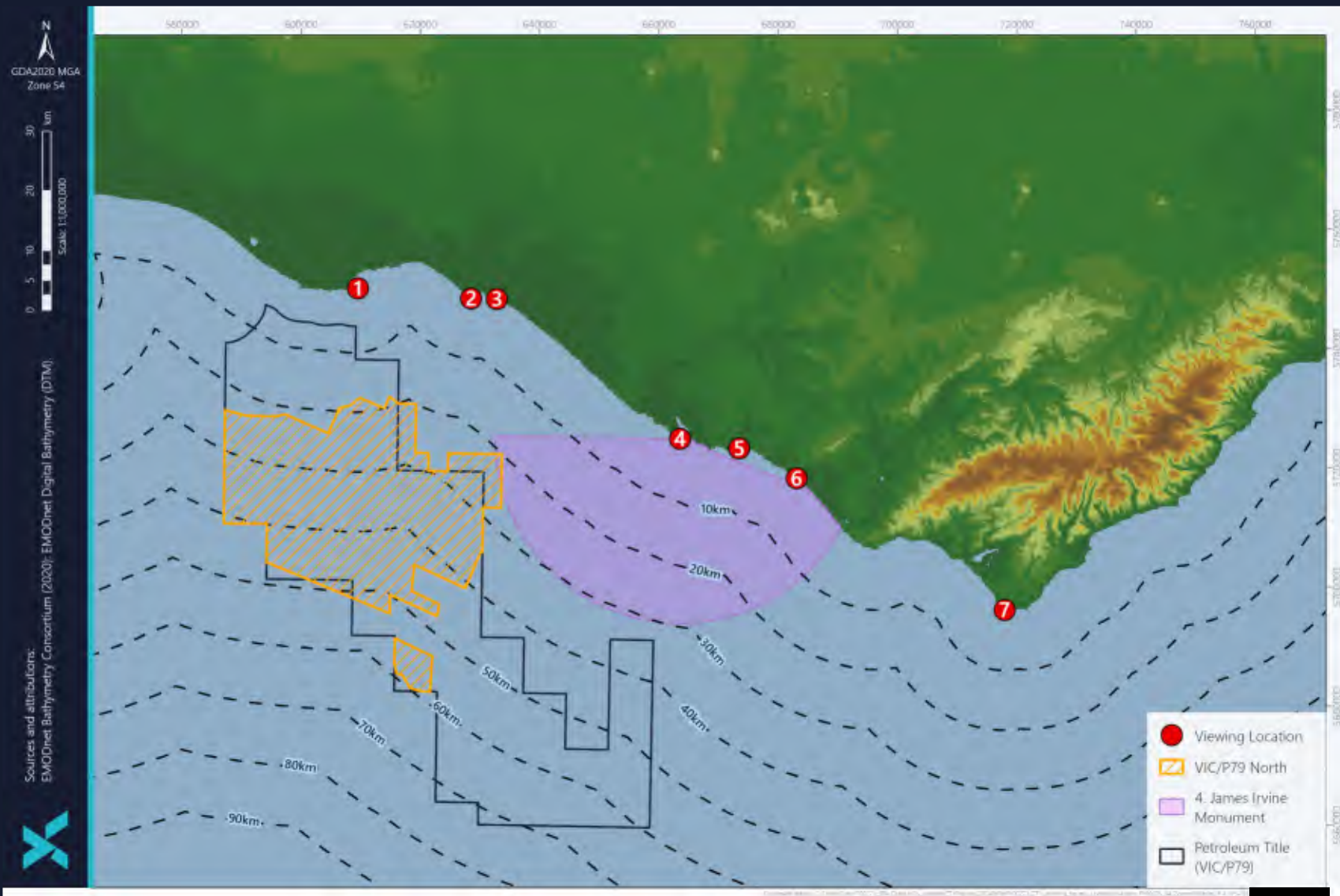


Site 3 viewshed for 22 m high object



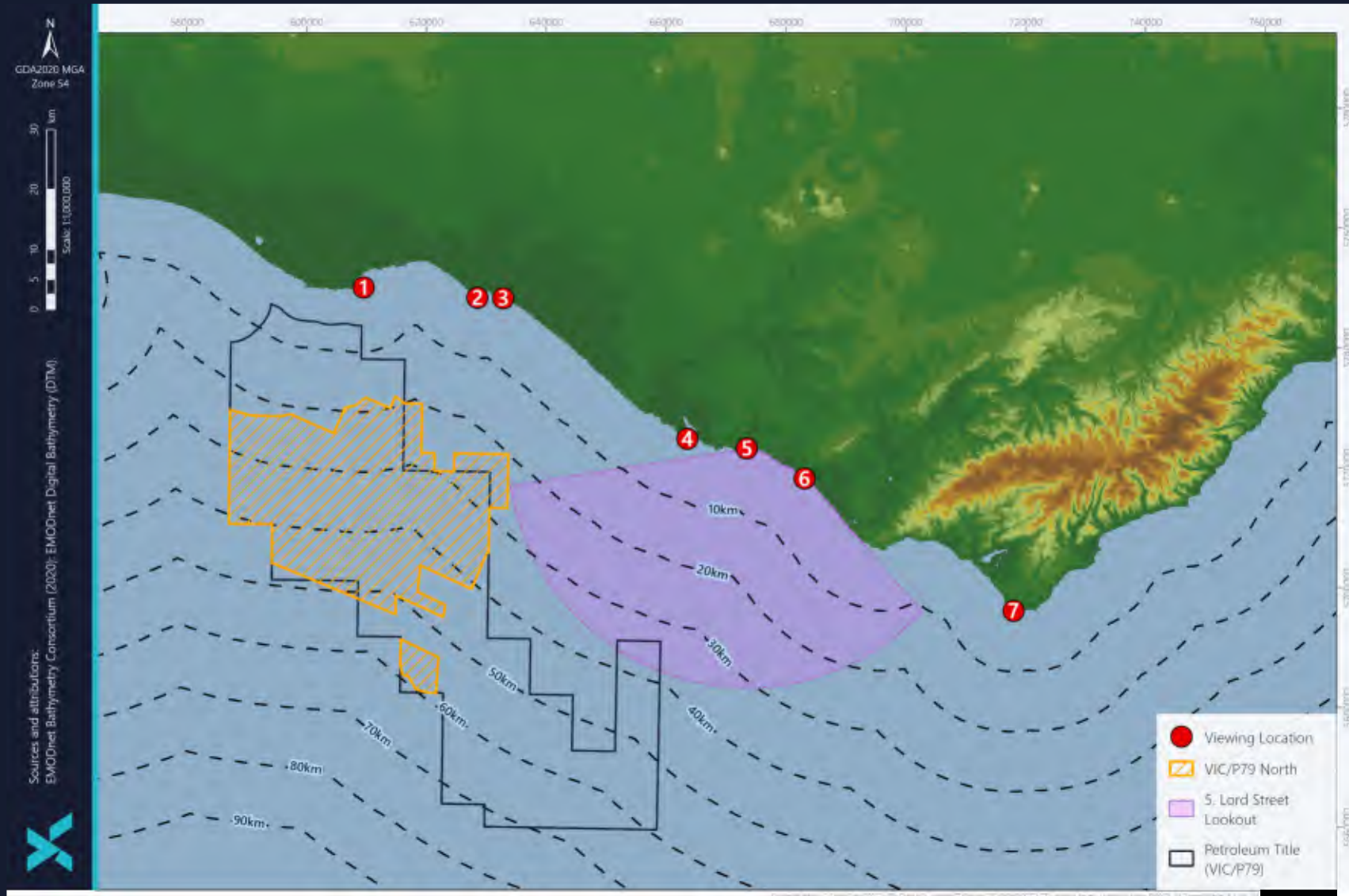


Site 4 viewshed for 22 m high object



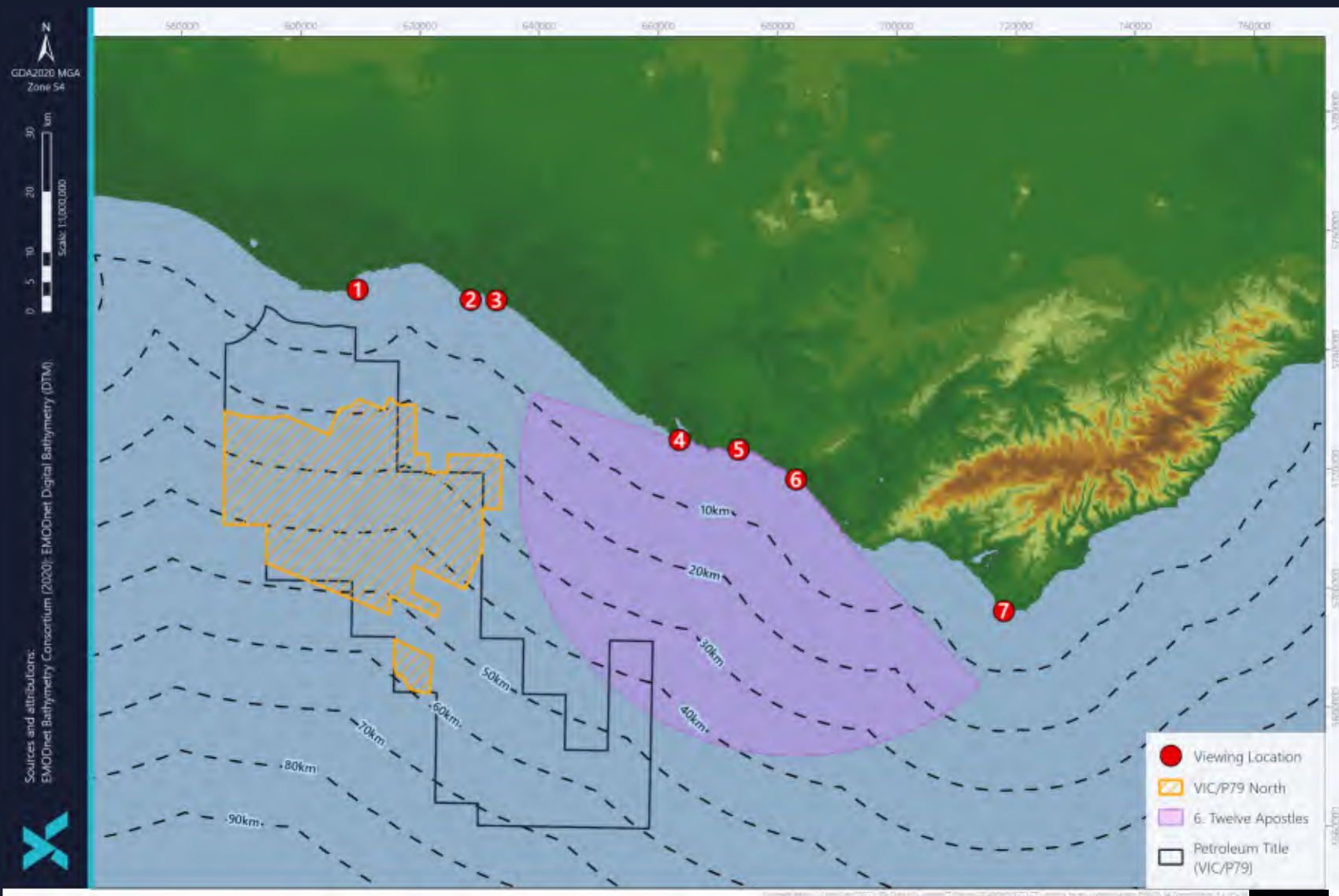


Site 5 viewshed for 22 m high object



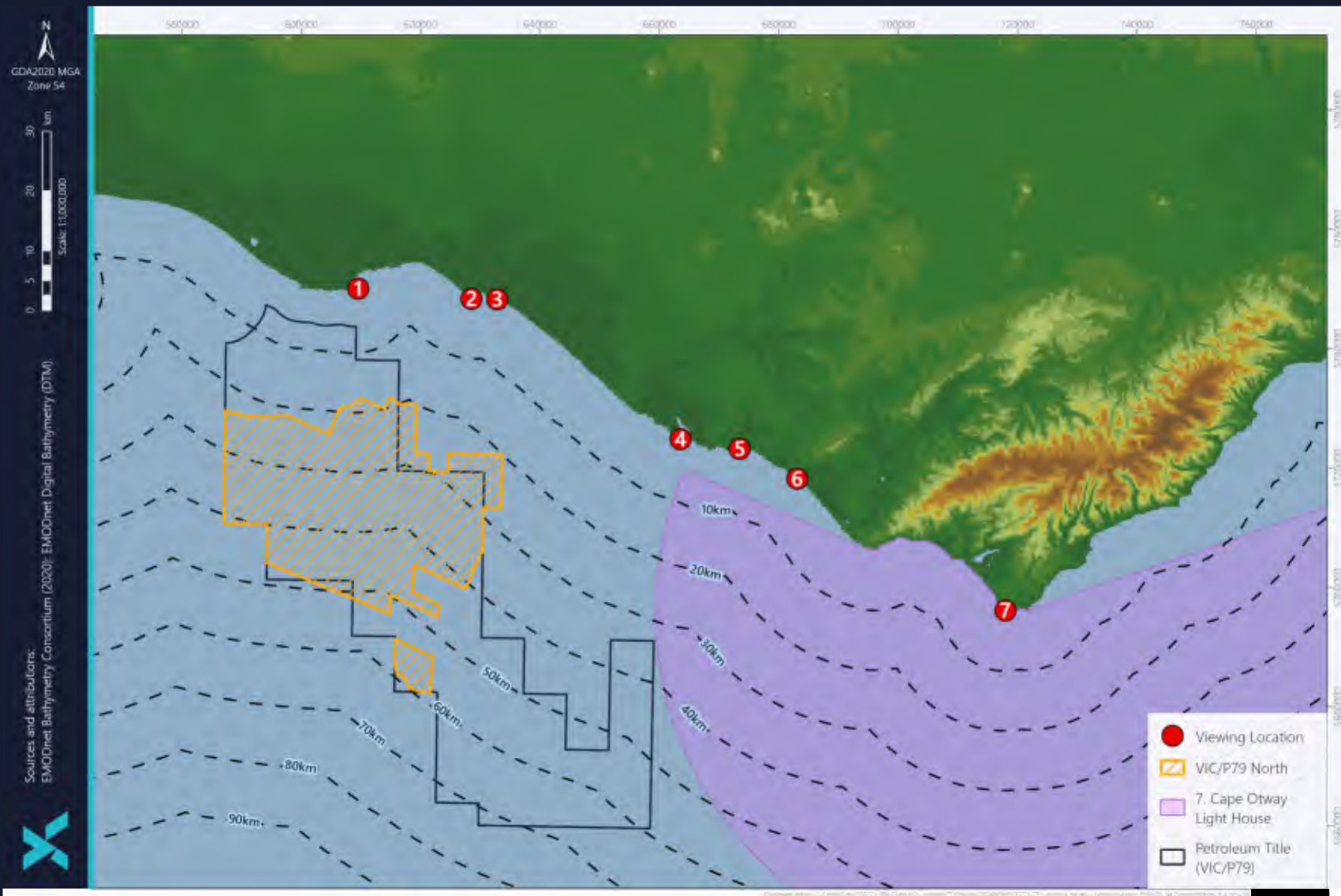


Site 6 viewshed for 22 m high object



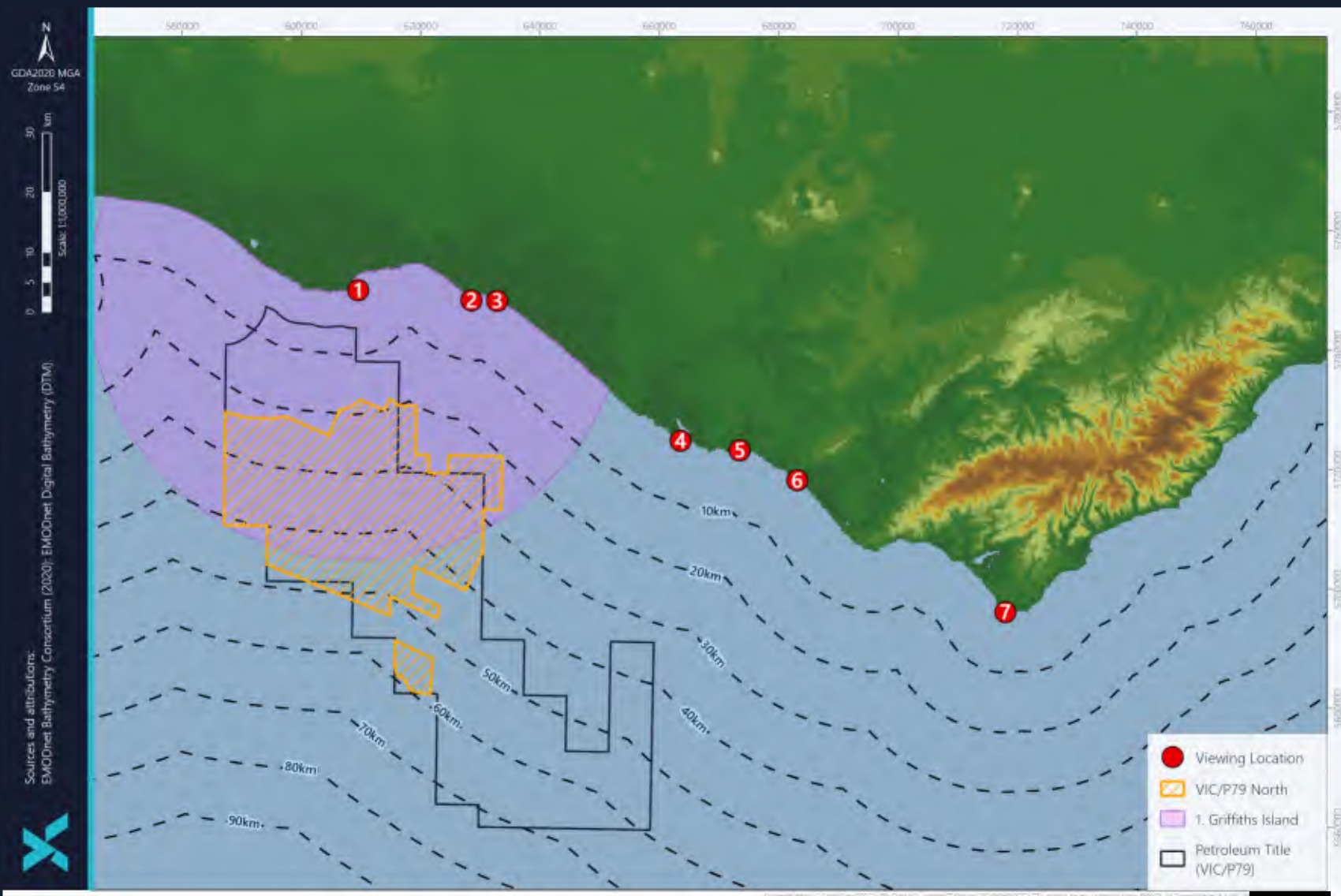


Site 7 viewshed for 22 m high object



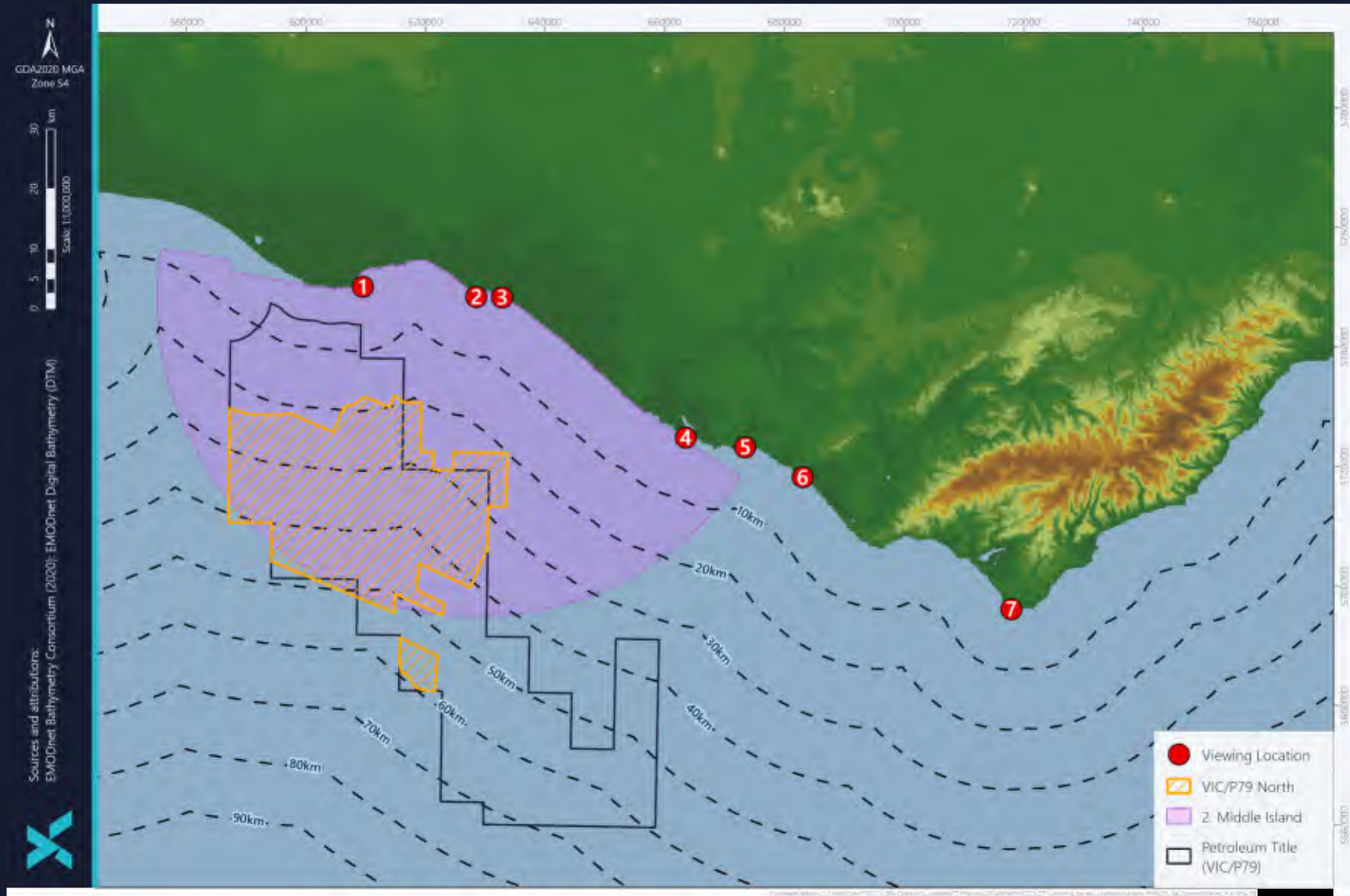


Site 1 viewshed for 85 m high object



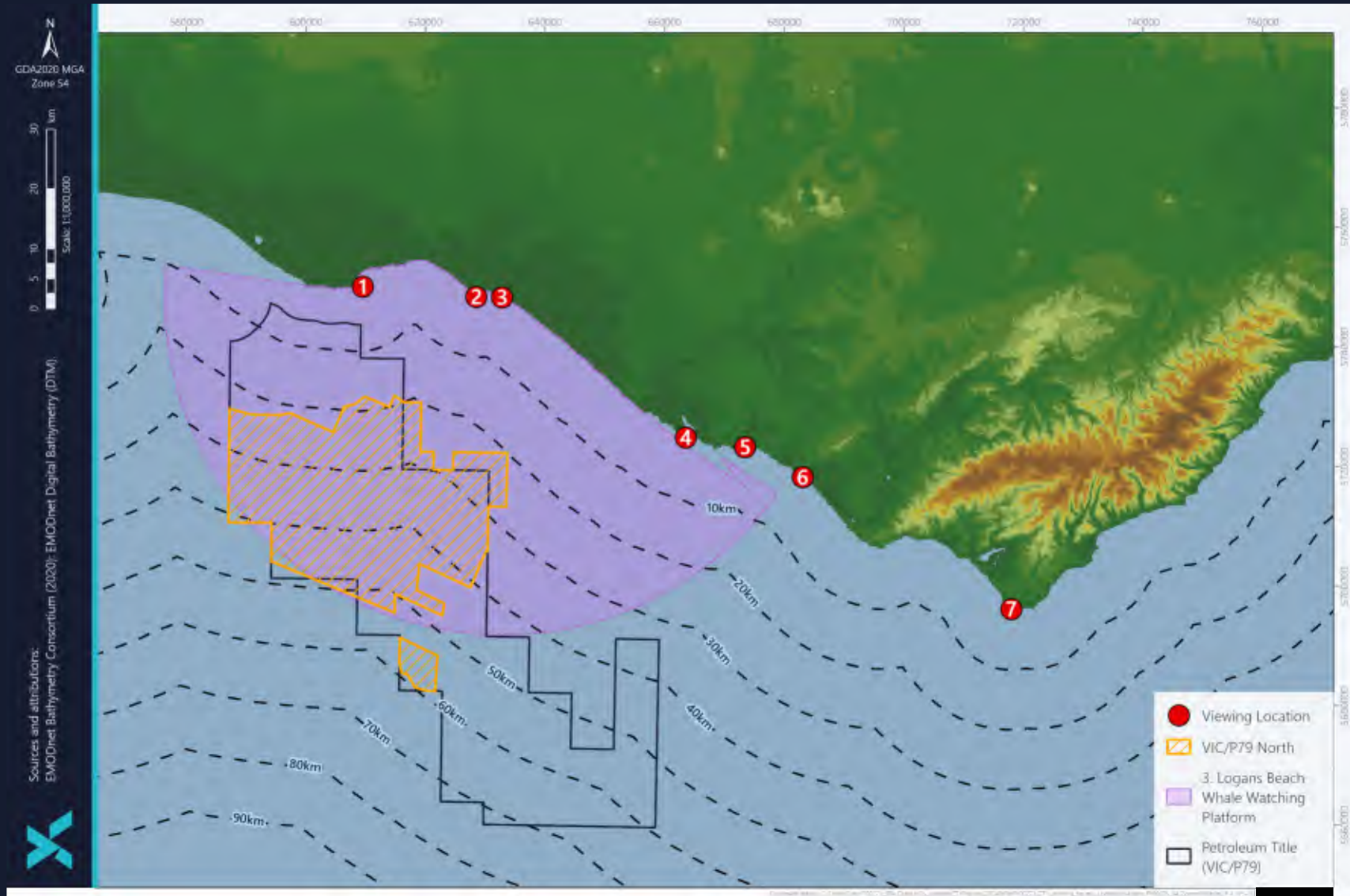


Site 2 viewshed for 85 m high object



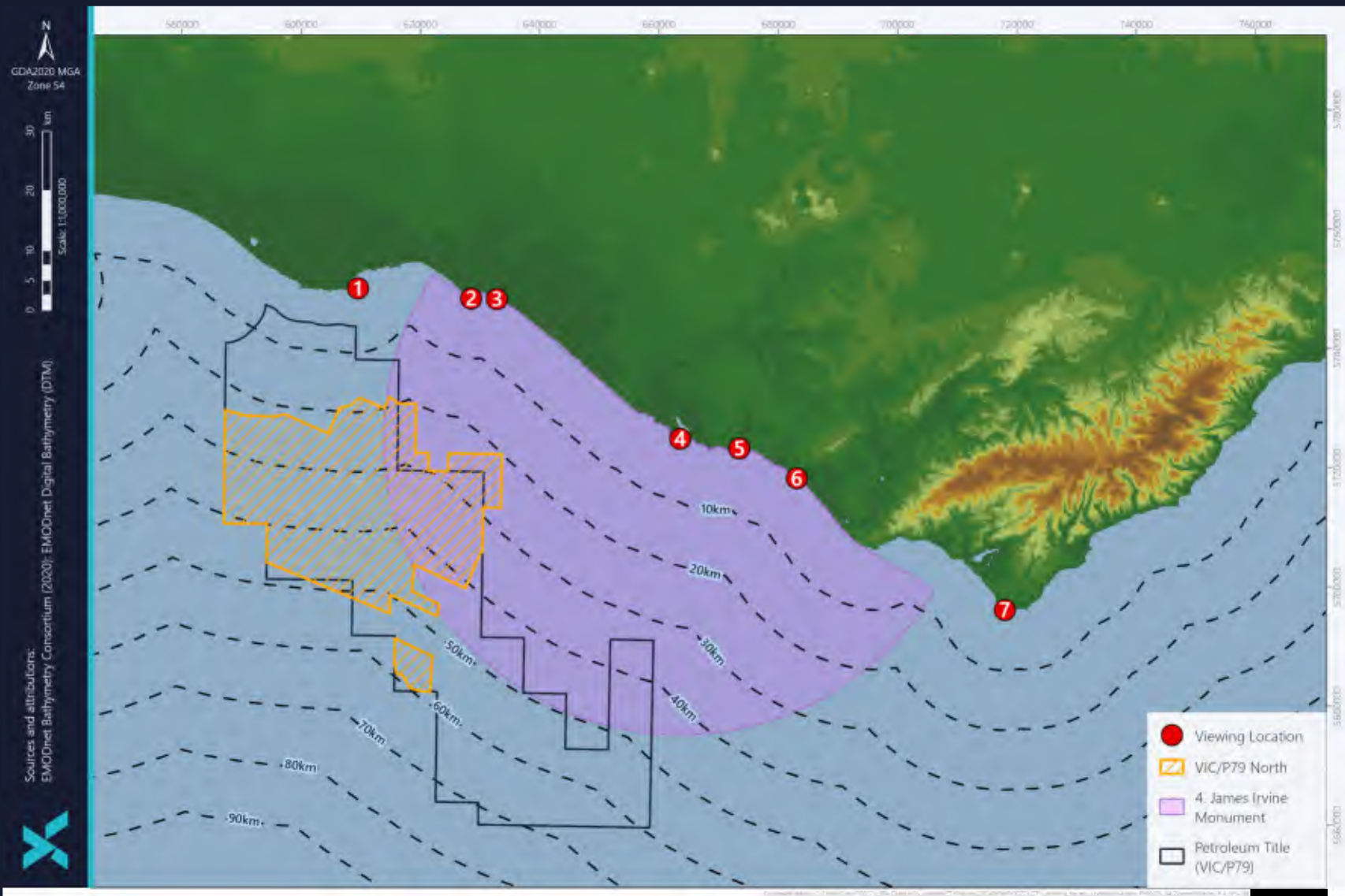


Site 3 viewshed for 85 m high object



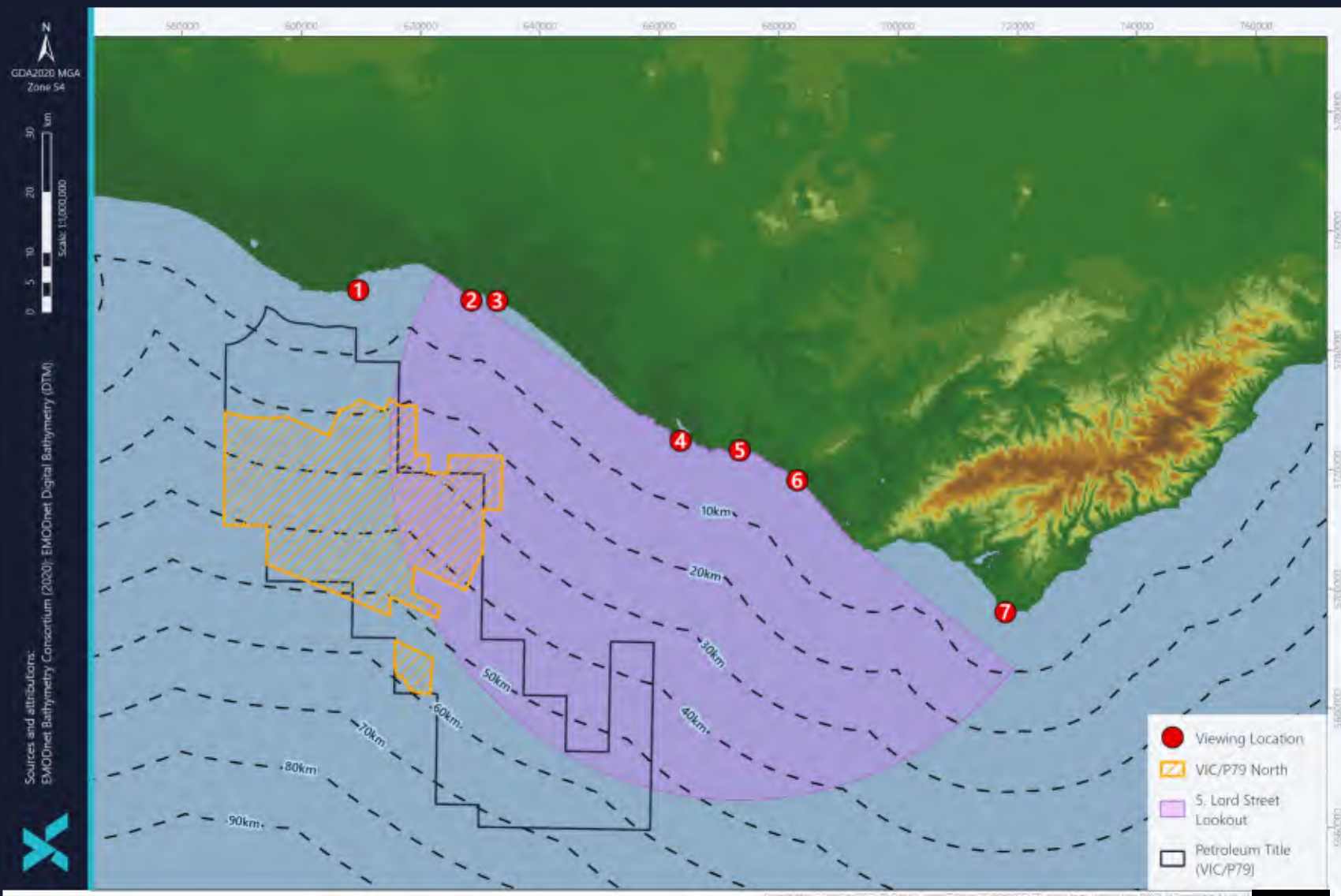


Site 4 viewshed for 85 m high object



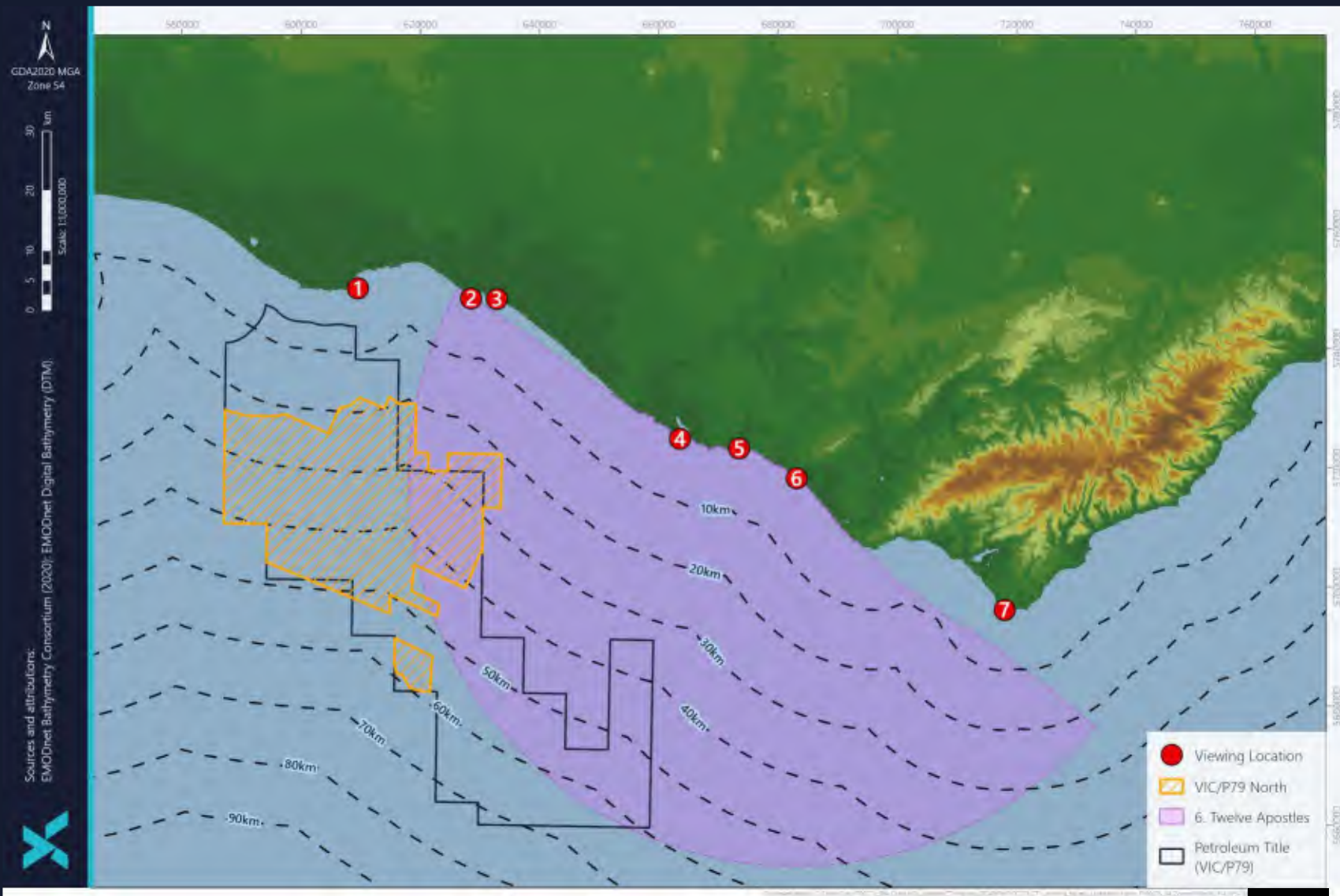


Site 5 viewshed for 85 m high object



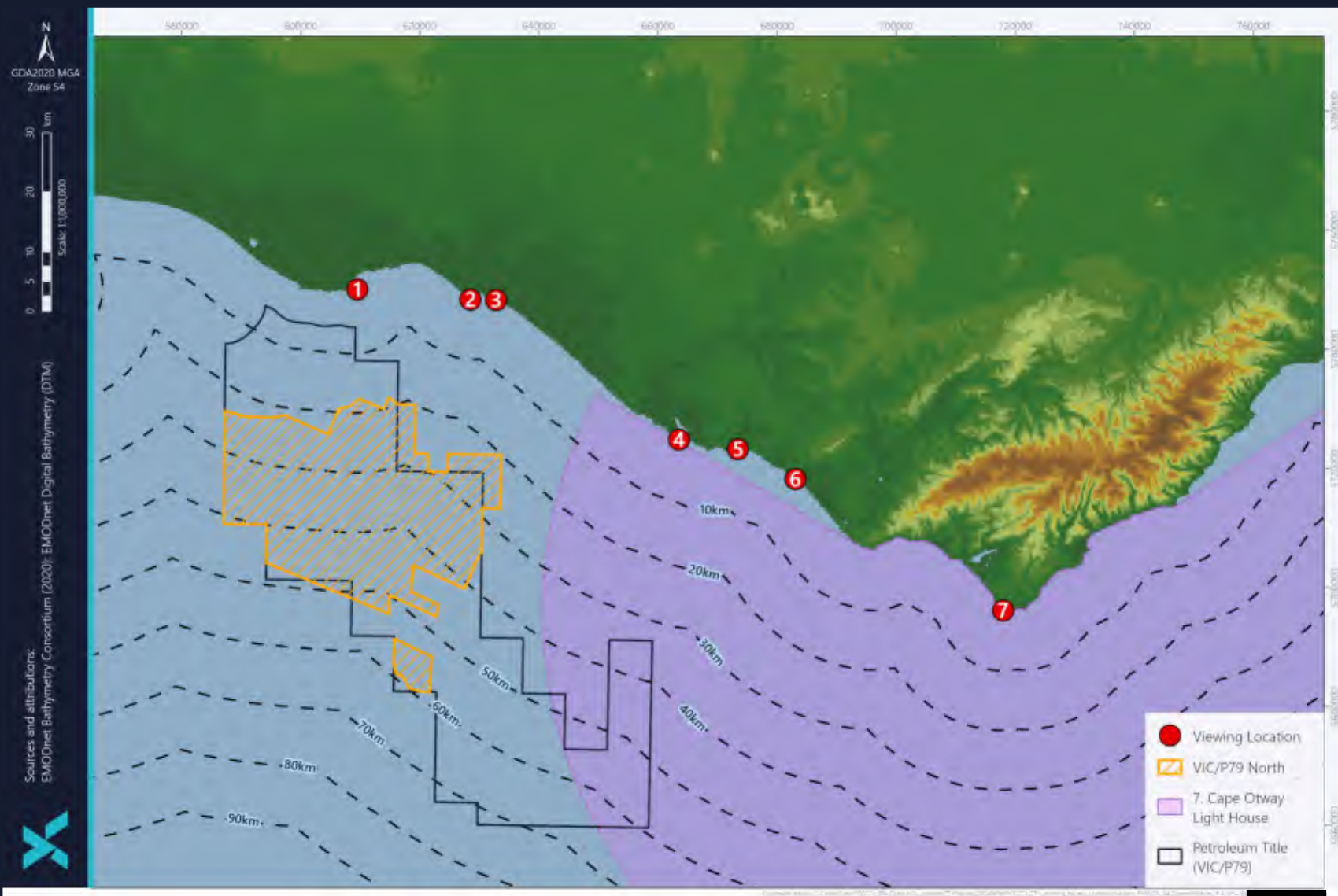


Site 6 viewshed for 85 m high object





Site 7 viewshed for 85 m high object

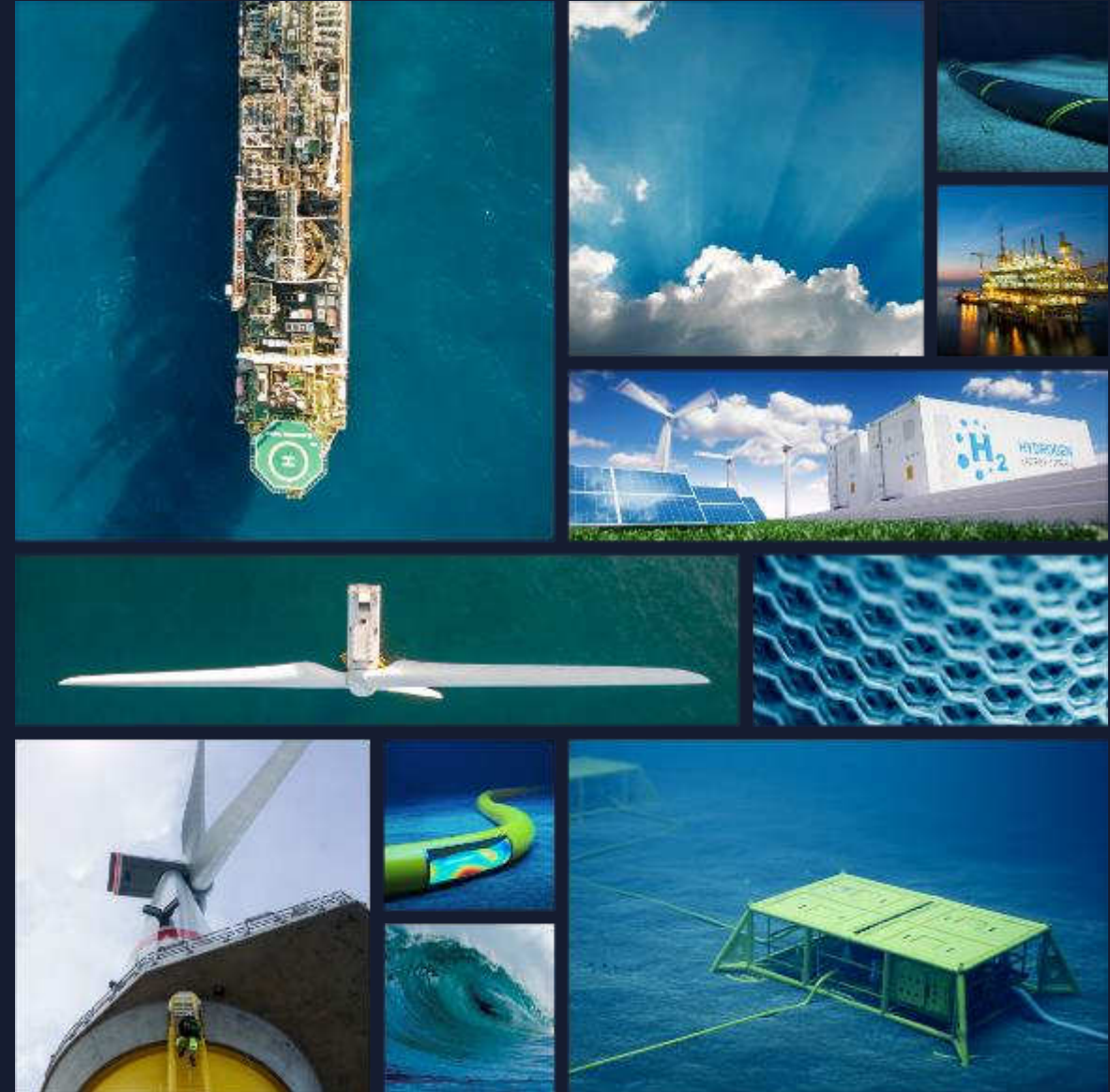




Zone of Theoretical Visibility (SOUTH)

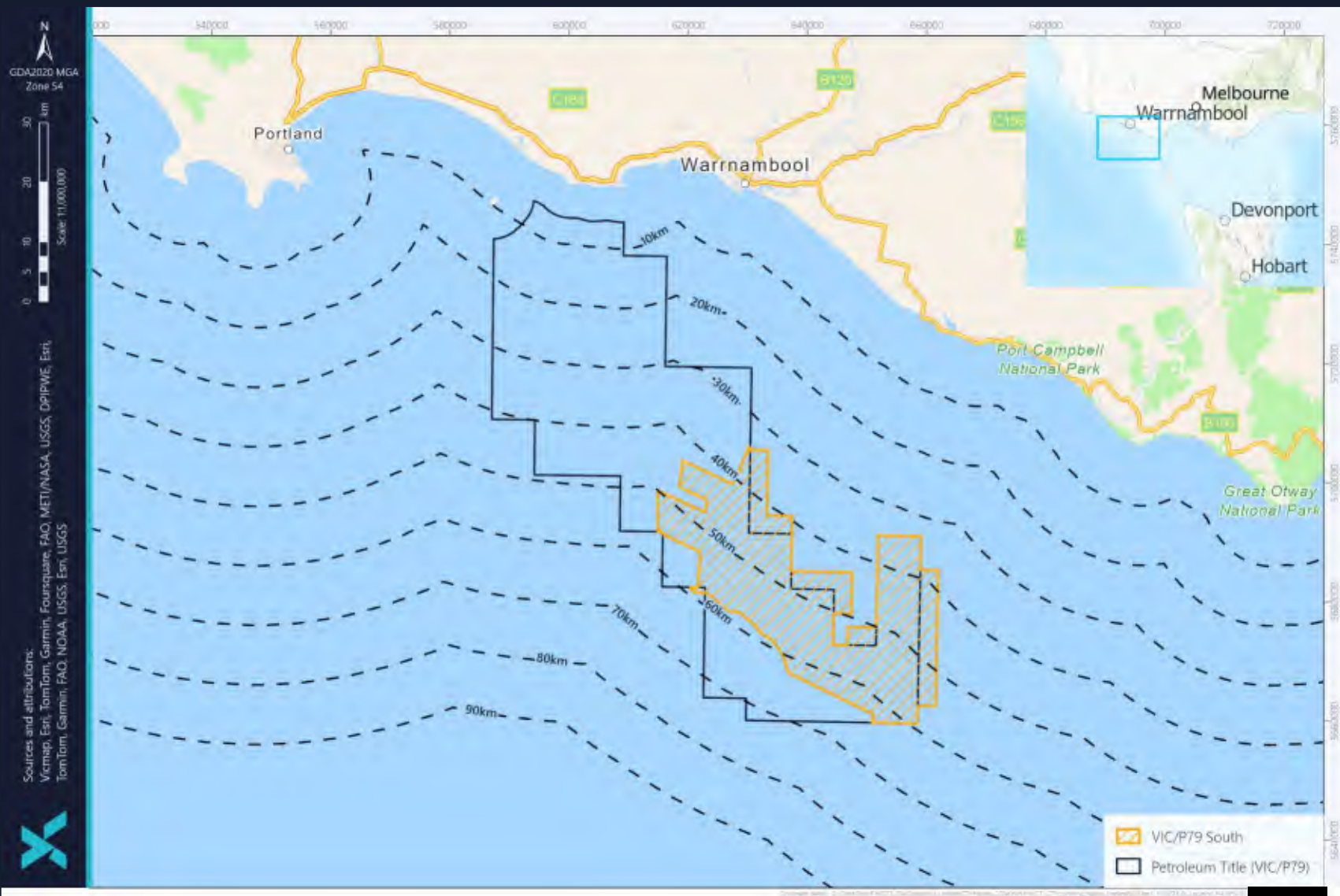
Geospatial visibility analysis of exploration activities within the southern extent of VIC/P79

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Target area VIC/P79 (South)



The Otway Basin is located along the Northern coast of Victoria, west of Melbourne.

The objective of this technical note is to present the outcomes of the assessment undertaken to estimate the Visual Impact from the project.

The study assess visibility of a platform from selected viewing locations.



Otway Coast elevation and infrastructure



The elevation of the region is diverse.

Great Otway National Park to the east has a mountain range pushing elevations up into the 600-650m range.

Travelling west from the national park, the terrain drops down from the range to become rolling hills.

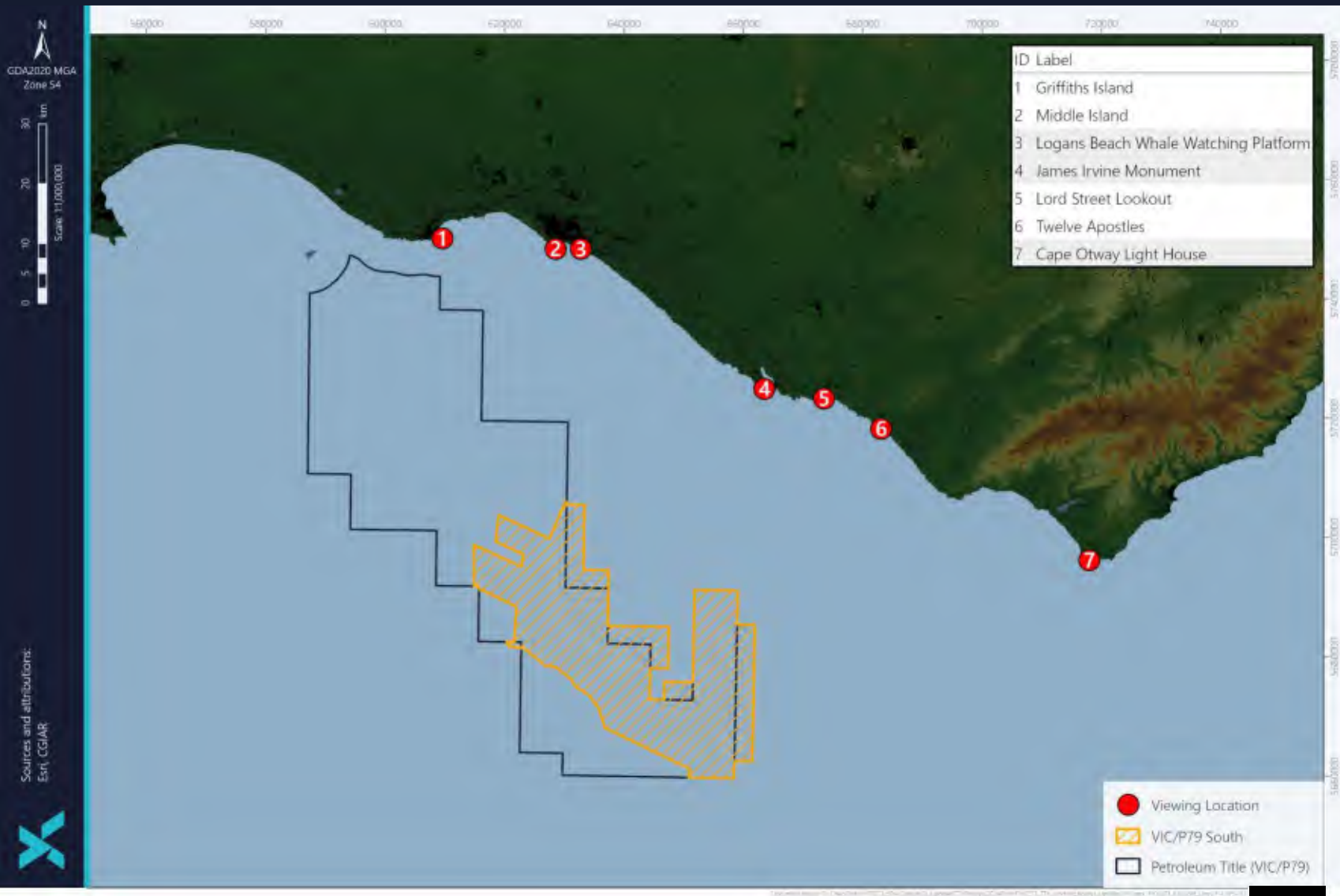
Continuing west, the terrain flattens out into lower elevation agricultural plains.

There are several towns and one larger regional hub (Warrnambool).

The coastline's unique geography/geology attracts tourists and therefore, has a series of viewing locations.



Otway coast viewing locations



For this study, seven locations were chosen based on the following factors:

1. Elevation
2. Visual access
3. Tourism amenity
4. Proximity to a point of interest

Griffiths Island

A tourism site at Port Fairy.

Middle Island

A prominent tourist attraction at Warrnambool with an elevated position for site seeing.

Logans Beach Whale Watching Platform

A prominent tourist attraction at Warrnambool with an elevated position for site seeing.

James Irvine Monument

A tourism site at Peterborough, has high visual amenity.

Lord Street Lookout

A tourism site at Port Campbell, has high visual amenity.

Twelve Apostles

A prominent tourist attraction with an elevated position for site seeing.

Cape Otway Light House

A tourism site with high visual amenity and elevated position.

Line of Sight Calculation

$$d = \left(2 \sqrt{\frac{4}{3}Rh_1 + h_1^2} \right)^{0.5} + \left(2 \sqrt{\frac{4}{3}Rh_2 + h_2^2} \right)^{0.5}$$

Where

- h_1 = height of object
- h_2 = height of receptor
- R = radius of earth
- d = total line of sight ($d_1 + d_2$)

Line of sight and Viewshed analyses are conducted using the standard calculation above.

The calculation determines a viewers (h) visible horizon limit (d_1). And if applicable, the observable distance of an object ($h_{receptor}$) beyond the horizon ($d_1 + d_2$).

As elevation/height of an observer increases, so does the distance to the horizon. Likewise, the viewable distance of an object beyond the horizon increases with it's elevation/height.

This assumes no adverse atmospheric conditions or obstructed field of view.



Calculated Viewshed

Label	Name	Elevation (m)	Horizon (km)	22 m Deck (km)	85 m Derrick (km)
1	Griffiths Island	3	7	27	45
2	Middle Island	14	15	35	53
3	Logans Beach Whale Watching Platform	20	18	38	56
4	James Irvine Monument	8	12	31	50
5	Lord Street Lookout	25	21	40	59
6	Twelve Apostles	43	27	46	65
7	Cape Otway Light House	91	39	59	77

These values represent the inputs (Elevation) and outputs (Horizon or Platform) of the calculated visibilities.

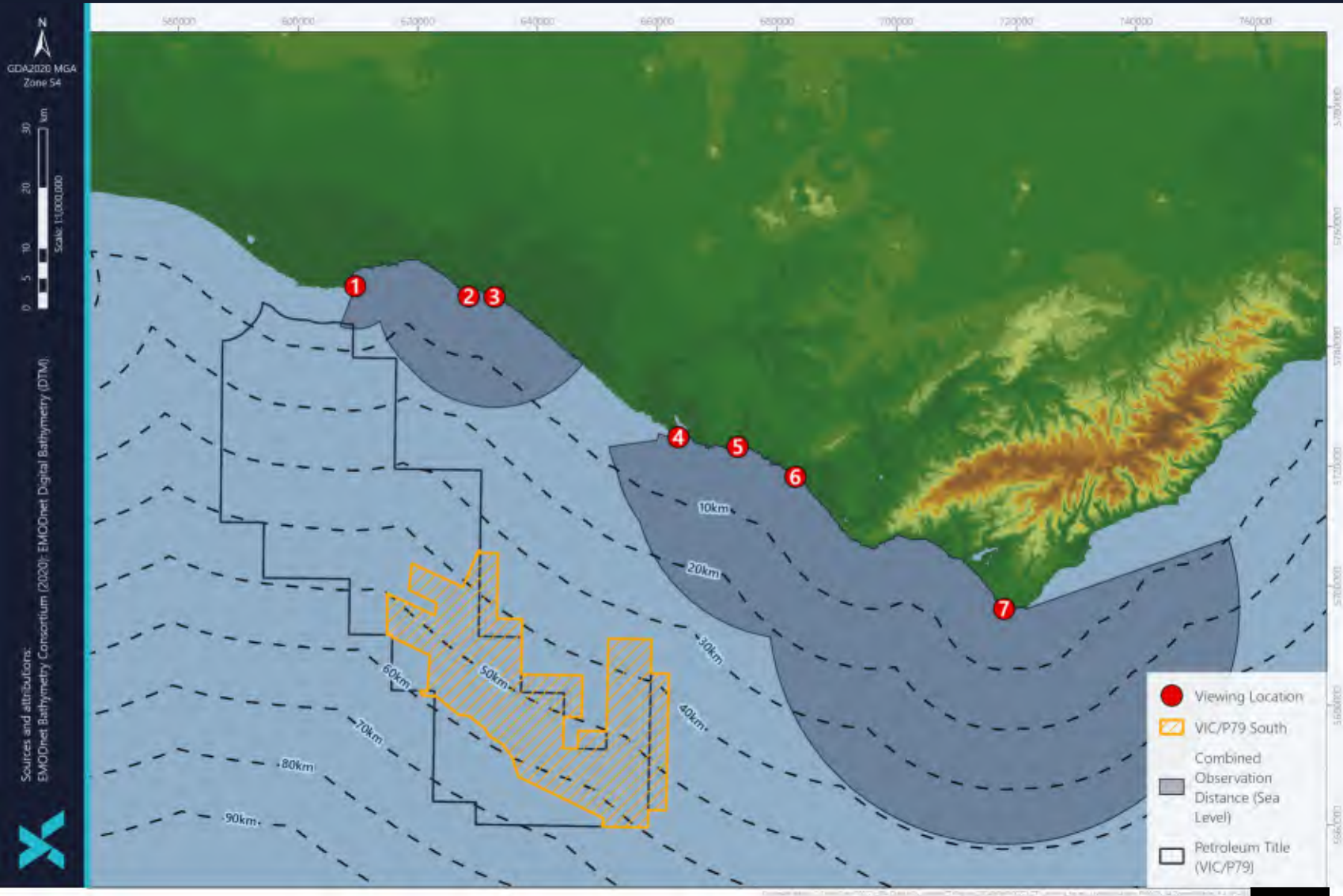
A 2 m tall observer at Griffiths Island (approximately 5 m above sea level) will see 39 km to the horizon. A 22 m high object will appear above the horizon to the observer up to 59 km away, and a 85 m high object will appear above the horizon up to 77 km away.

A main deck height of 22m and worst case scenario derrick height of 85 m has been used in this study. These represent the likely heights.

Each location’s elevation has had 2 m added as the elevation, to create the observers height.



Otway Basin viewshed for sea level horizon

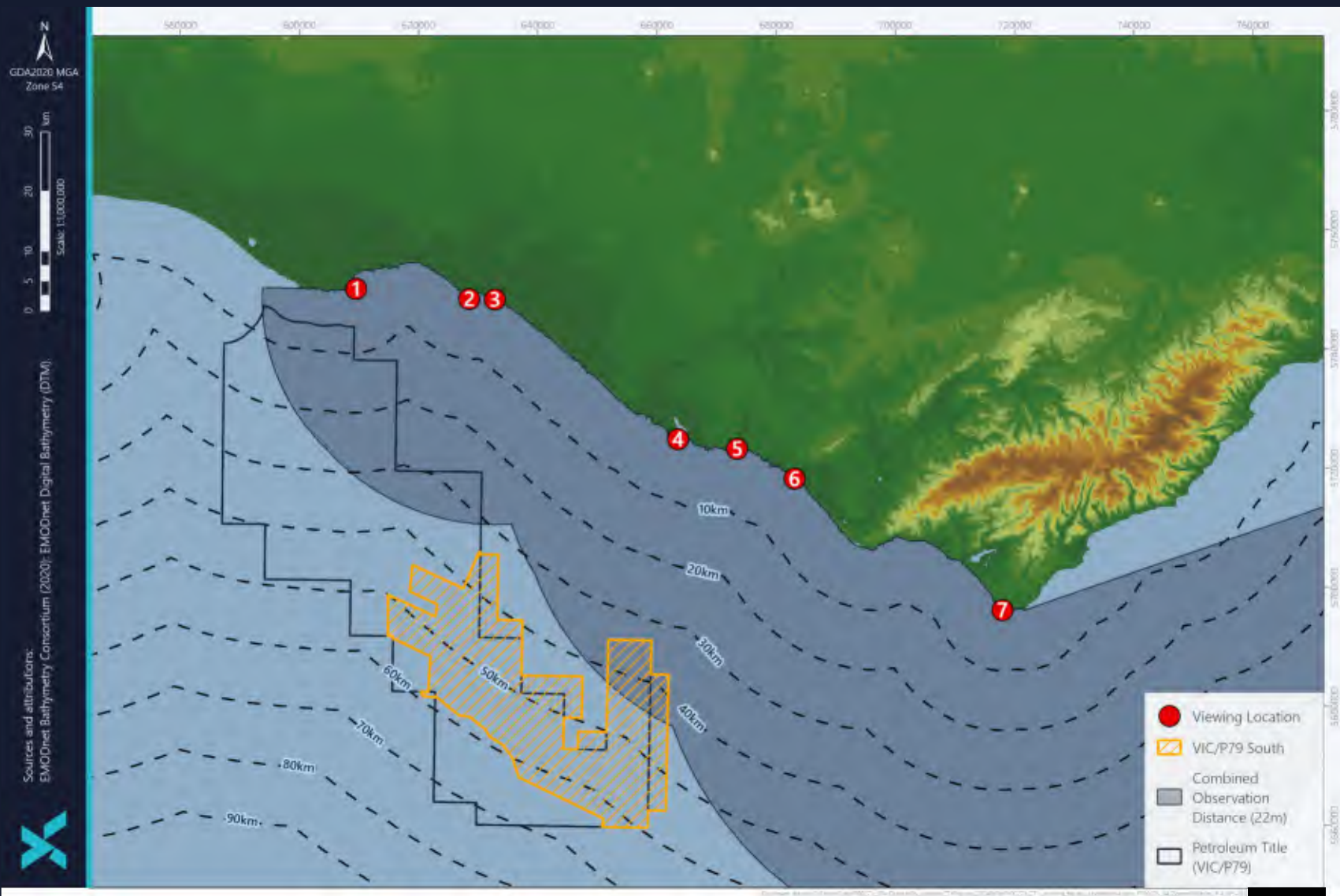


The fans of visibility (viewshed) represent the maximum viewable area from each location. As is demonstrated, the areas are dissected by local obstructions (islands and other landforms).

The entire permit area (at sea level) is not visible from any study location.



Otway Basin viewshed for 22 metre high object

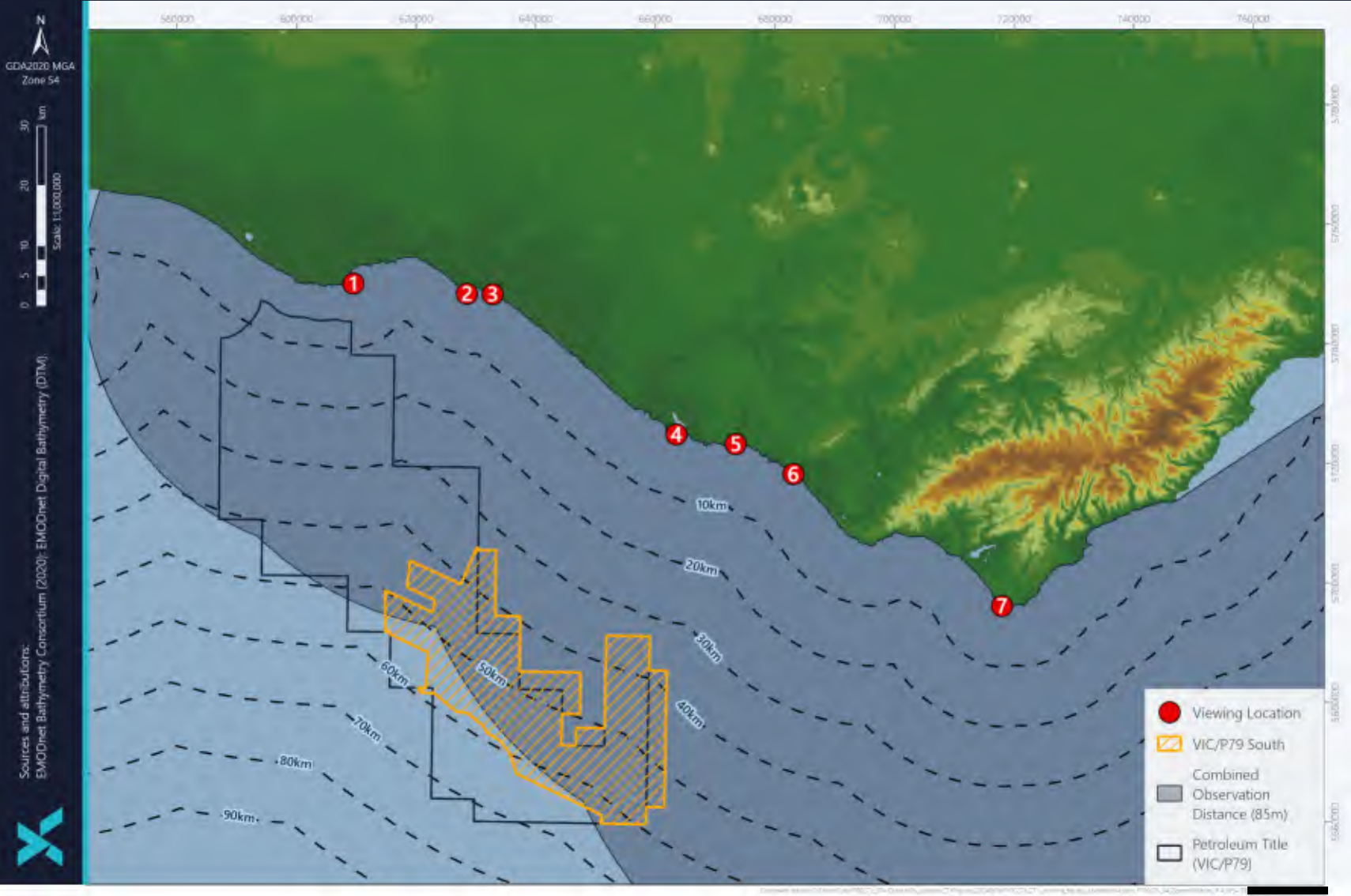


The fans of visibility represent the maximum viewable area of a 22 m high deck from each location.

The majority of the permit can host a 22 m high deck without visual impact.



Otway Basin viewshed for 85 m high object

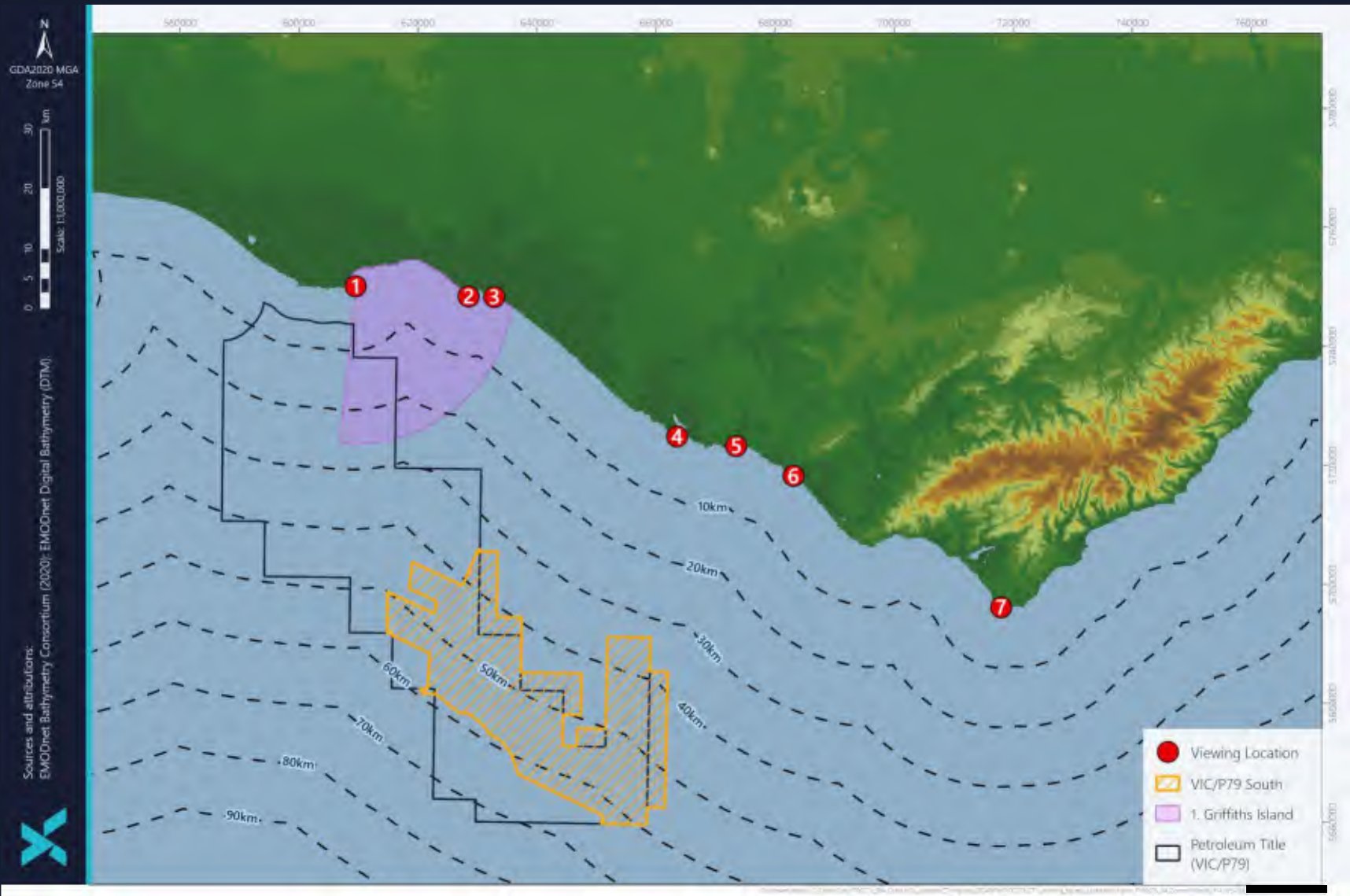


The fans of visibility represent the maximum viewable area of a 85 m high derrick from each location.

A 85 m high derrick will be visible from all viewing sites (see individual viewshed images).

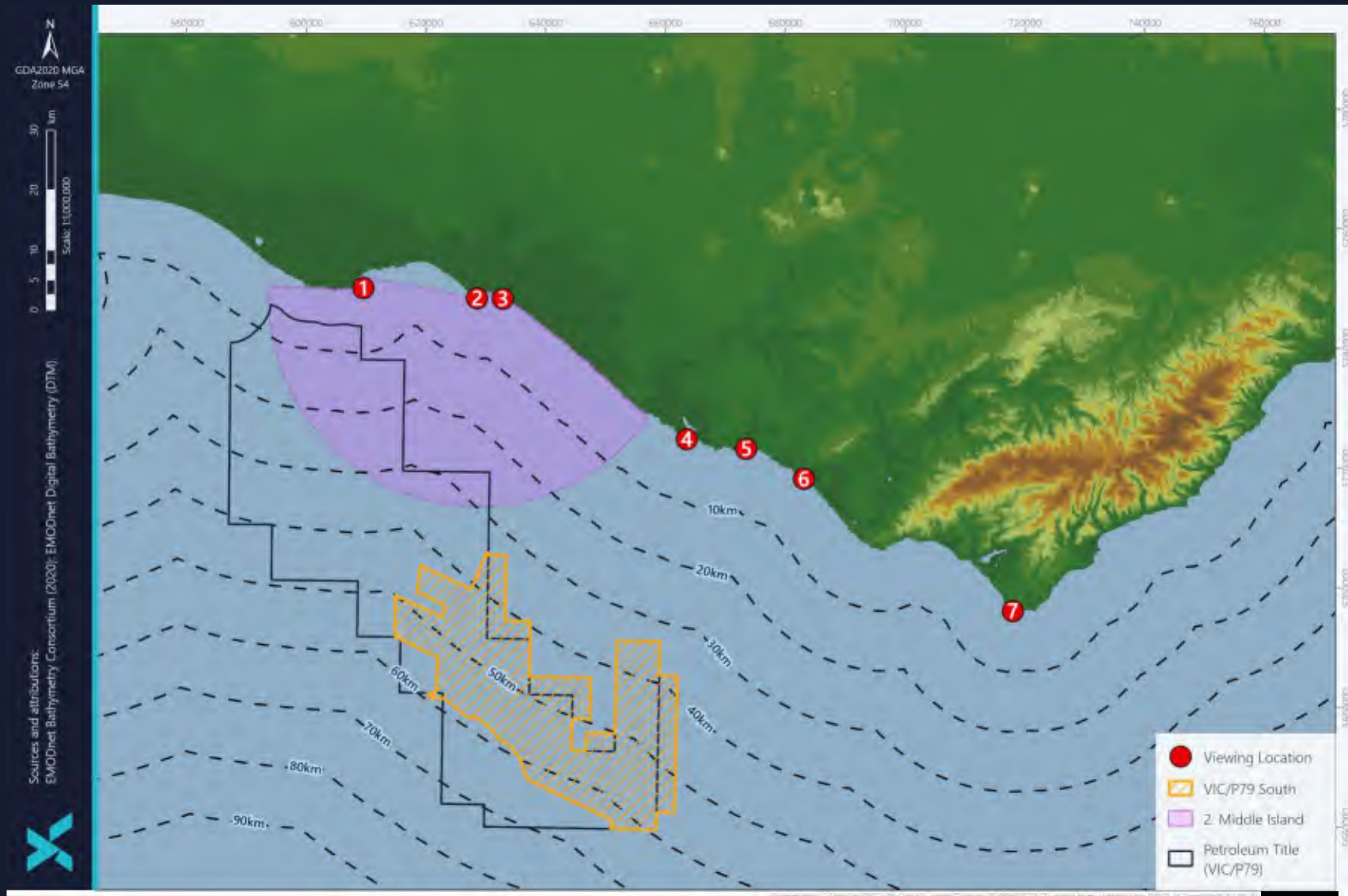


Site 1 viewshed for 22 m high object



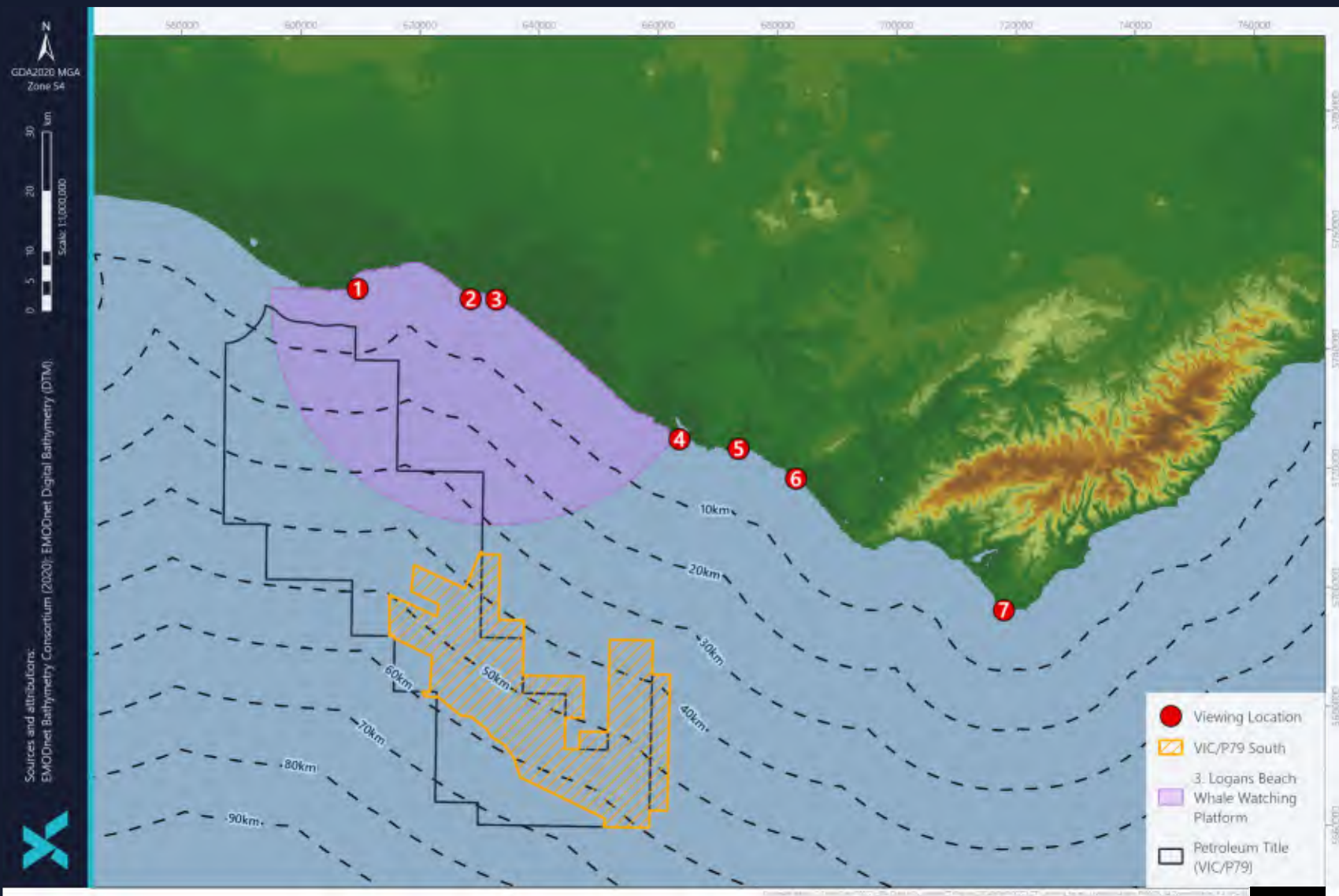


Site 2 viewshed for 22 m high object



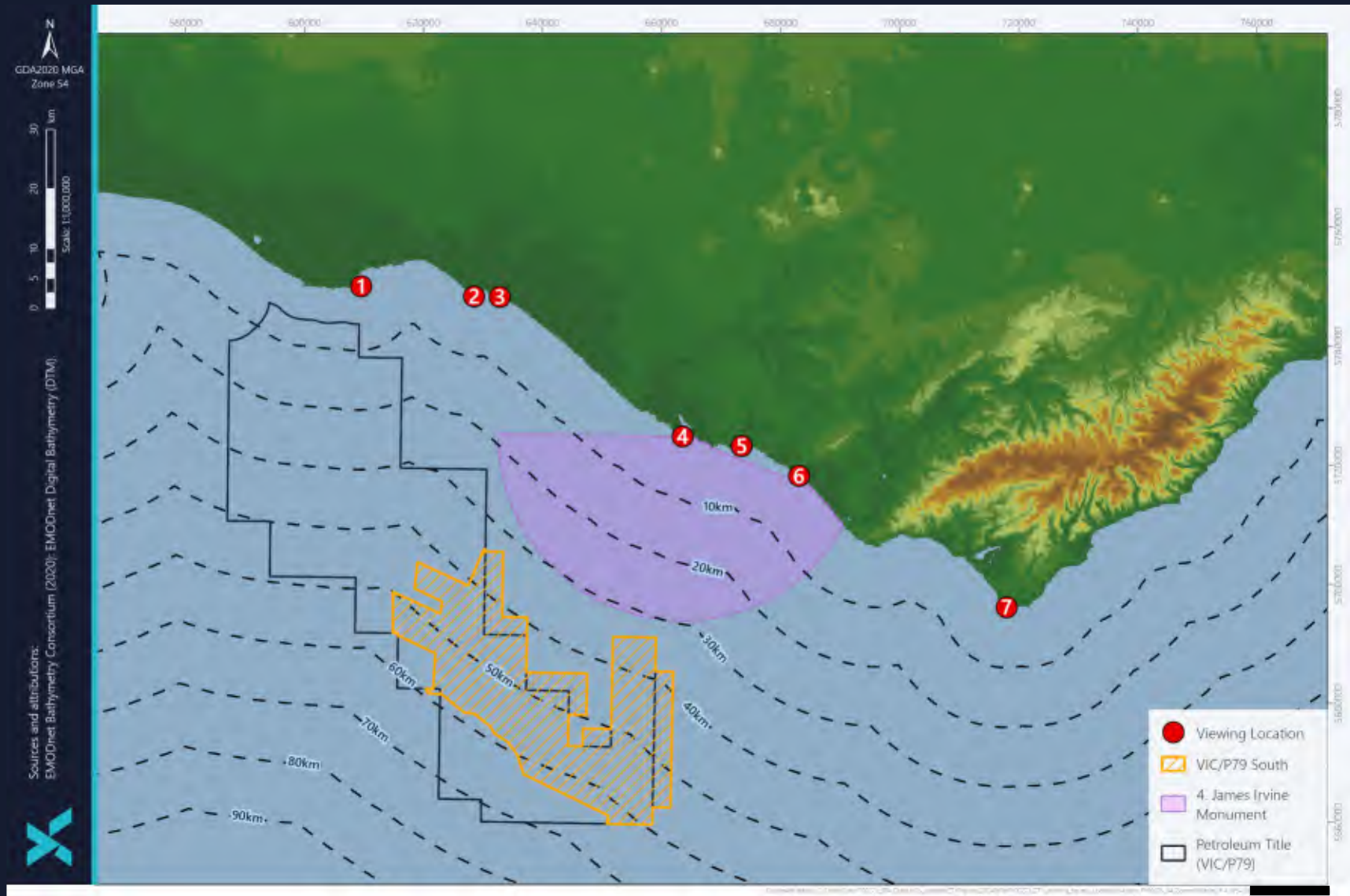


Site 3 viewshed for 22 m high object



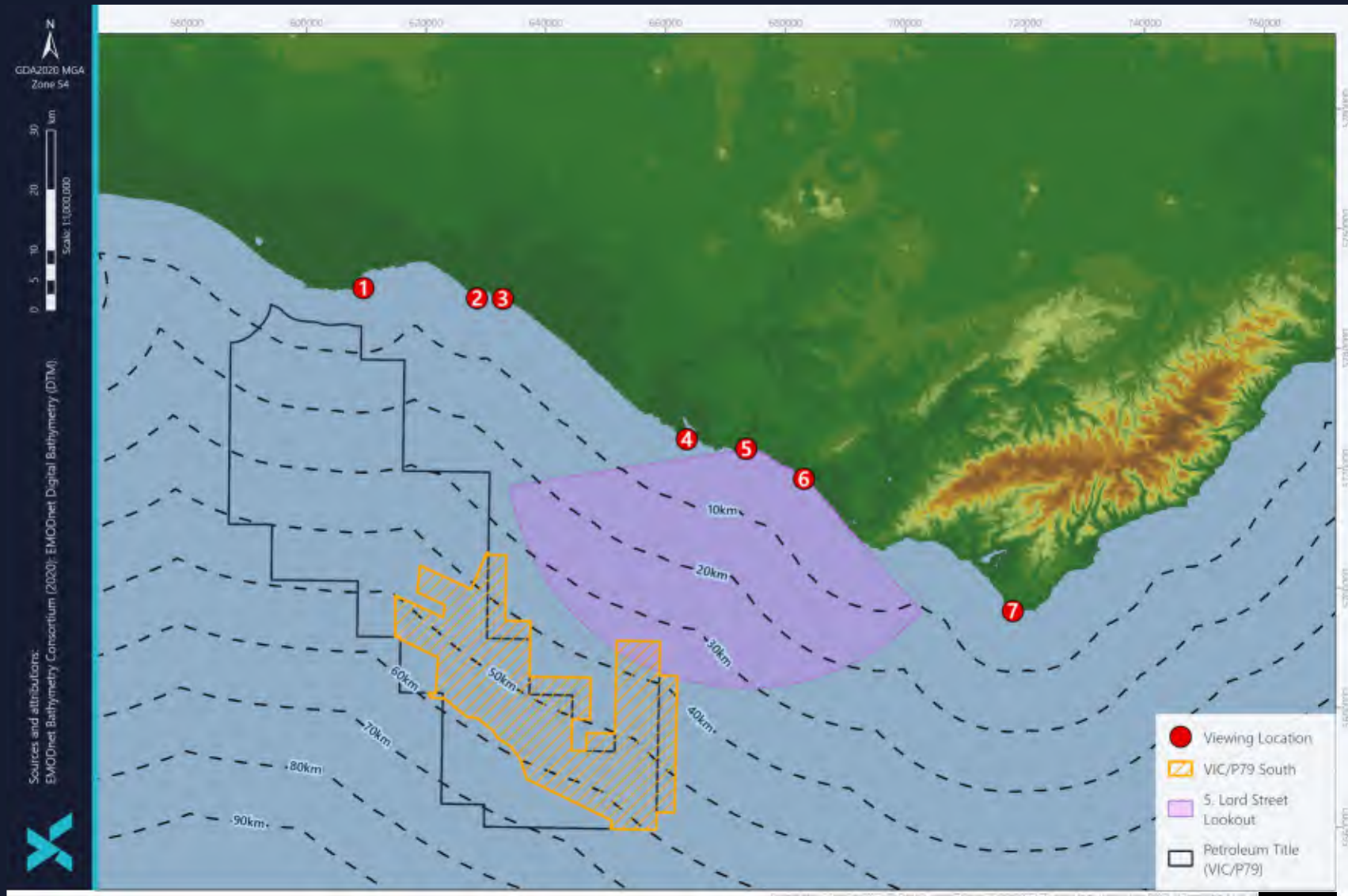


Site 4 viewshed for 22 m high object



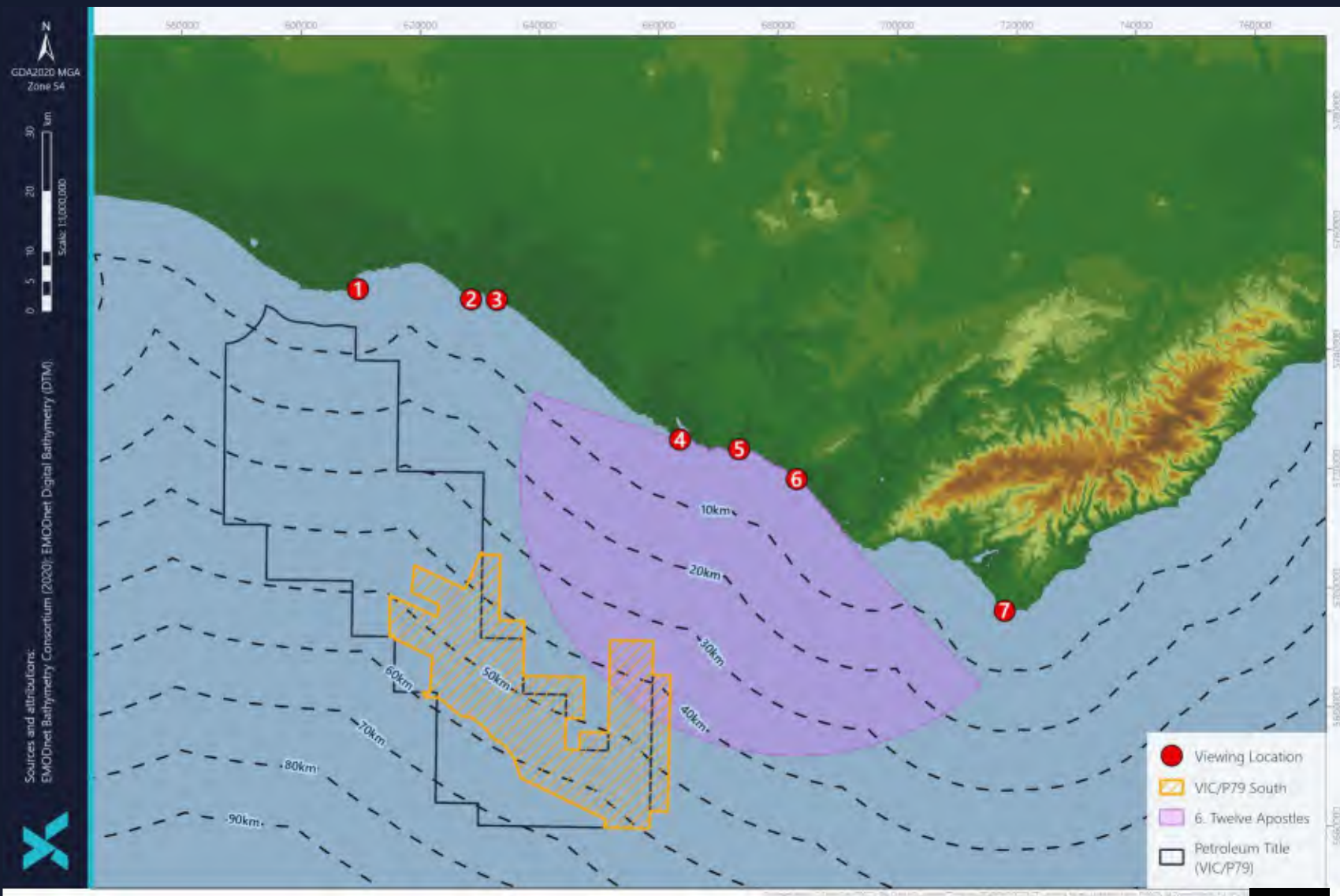


Site 5 viewshed for 22 m high object



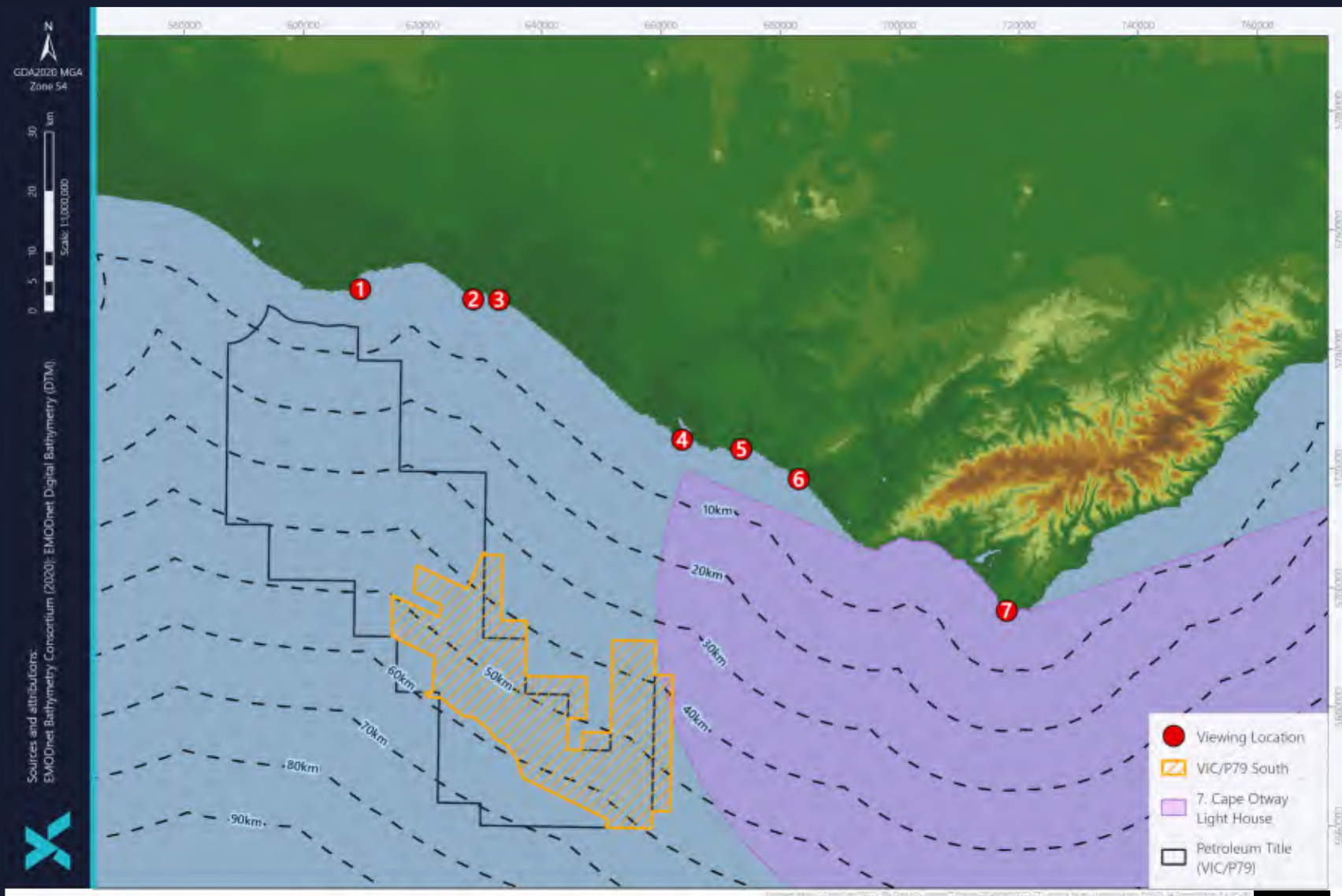


Site 6 viewshed for 22 m high object



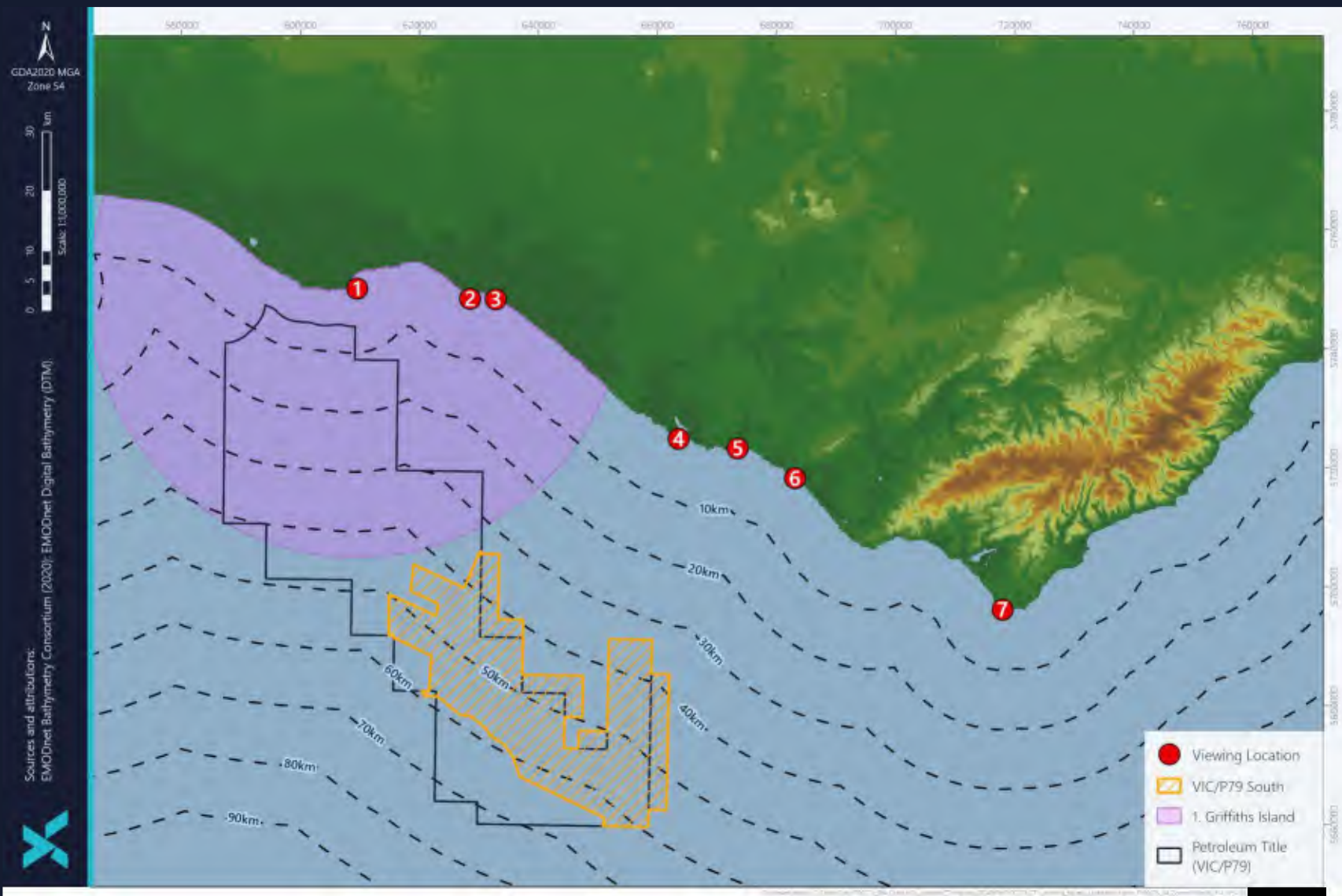


Site 7 viewshed for 22 m high object



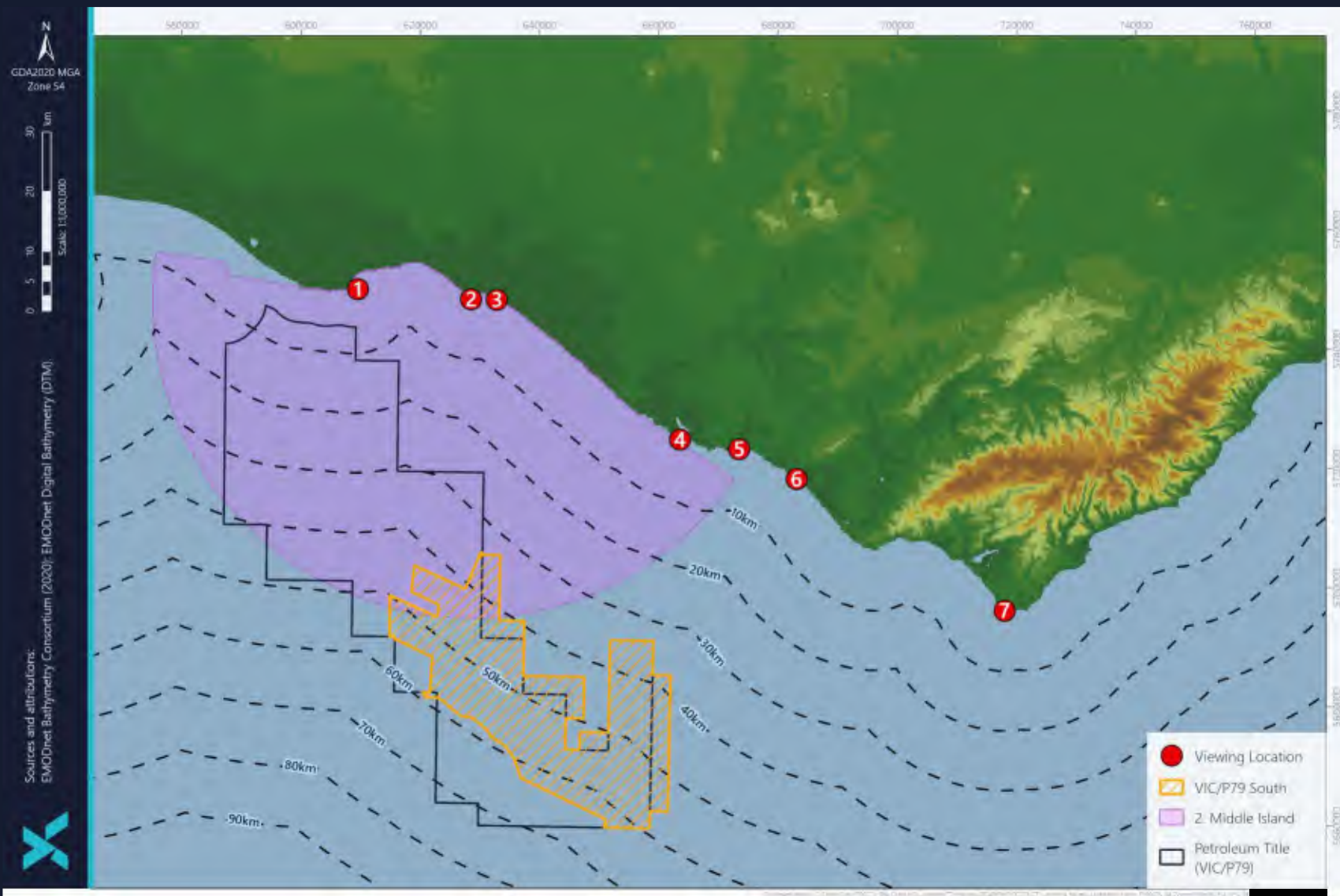


Site 1 viewshed for 85 m high object



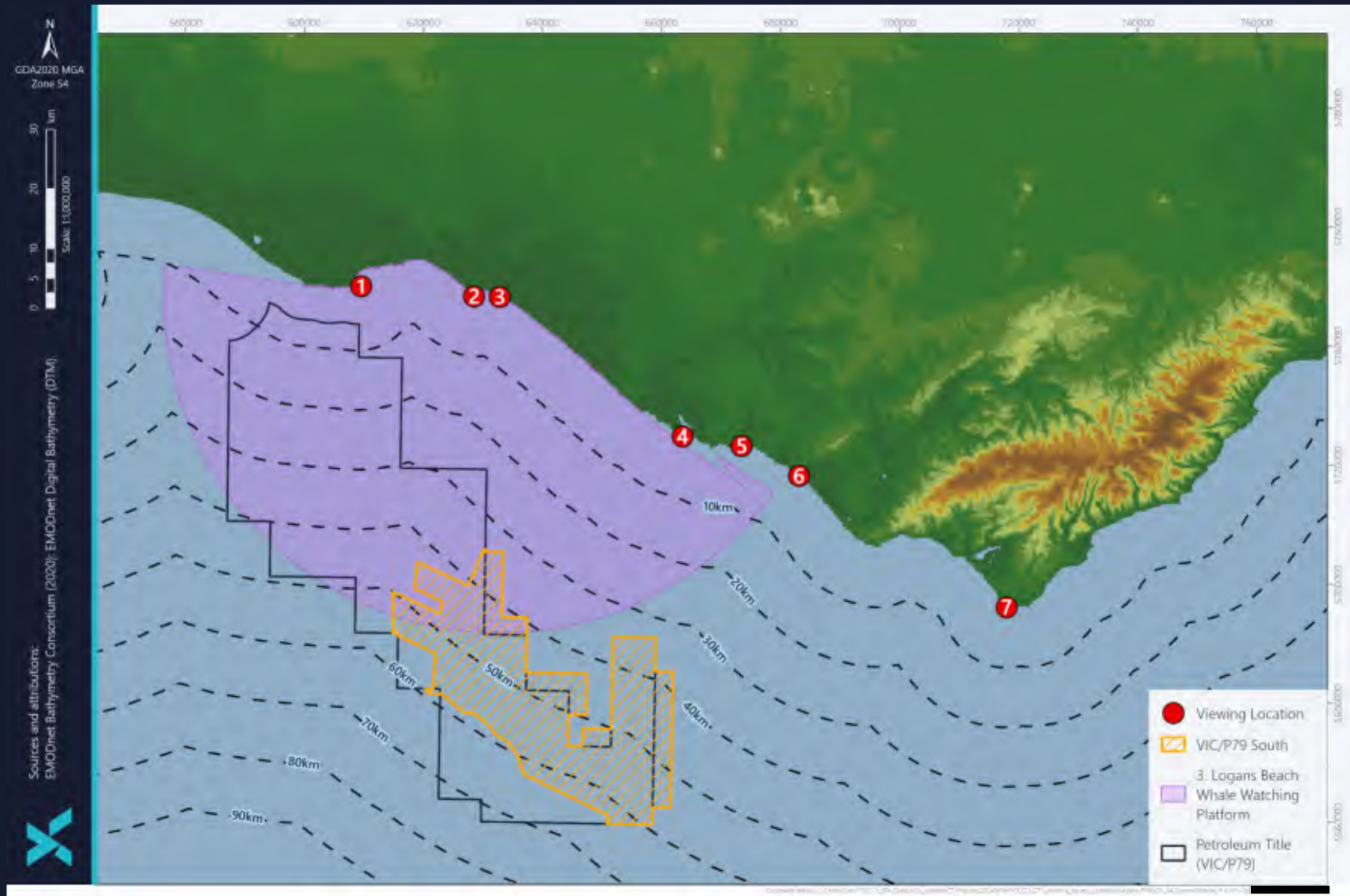


Site 2 viewshed for 85 m high object



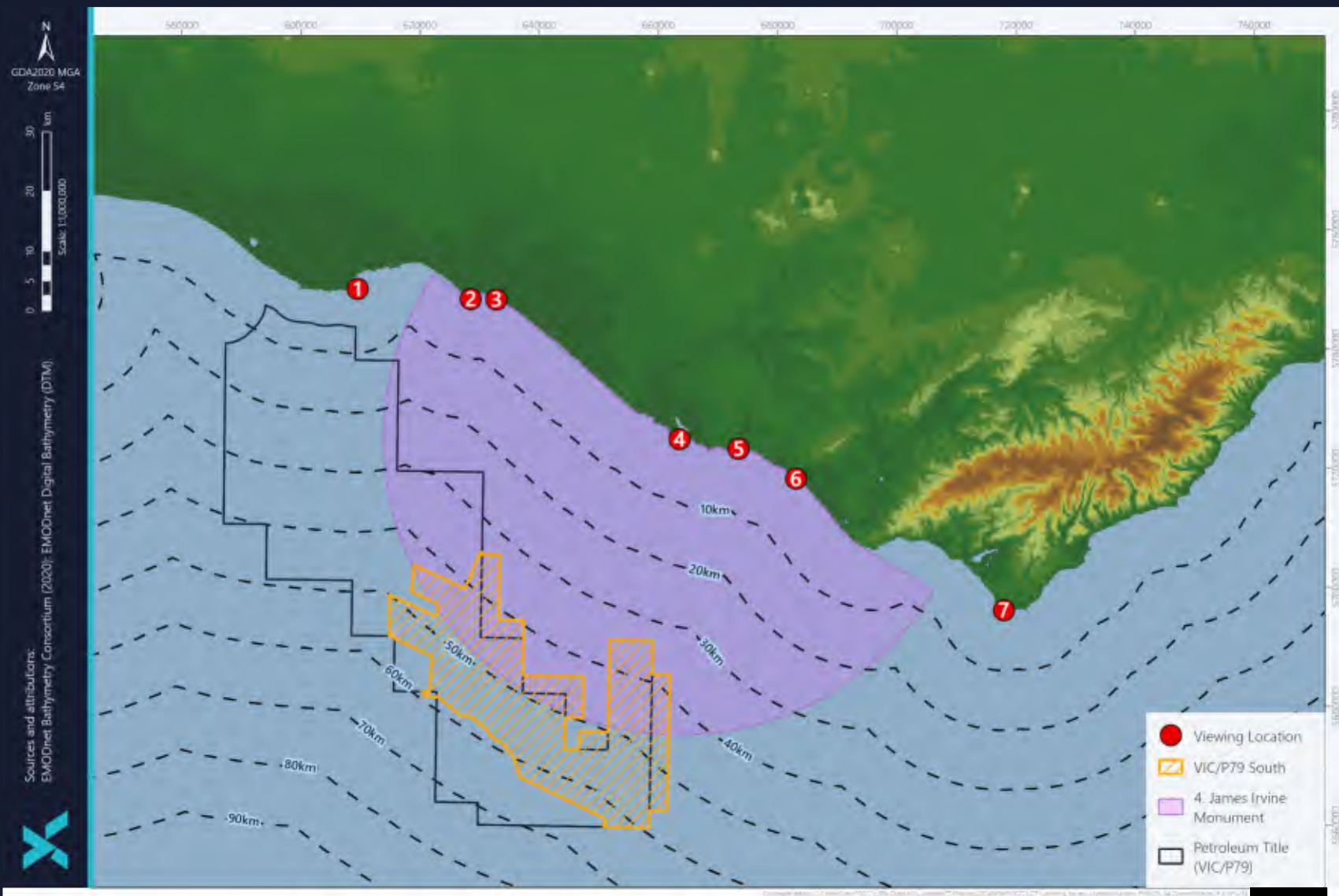


Site 3 viewshed for 85 m high object



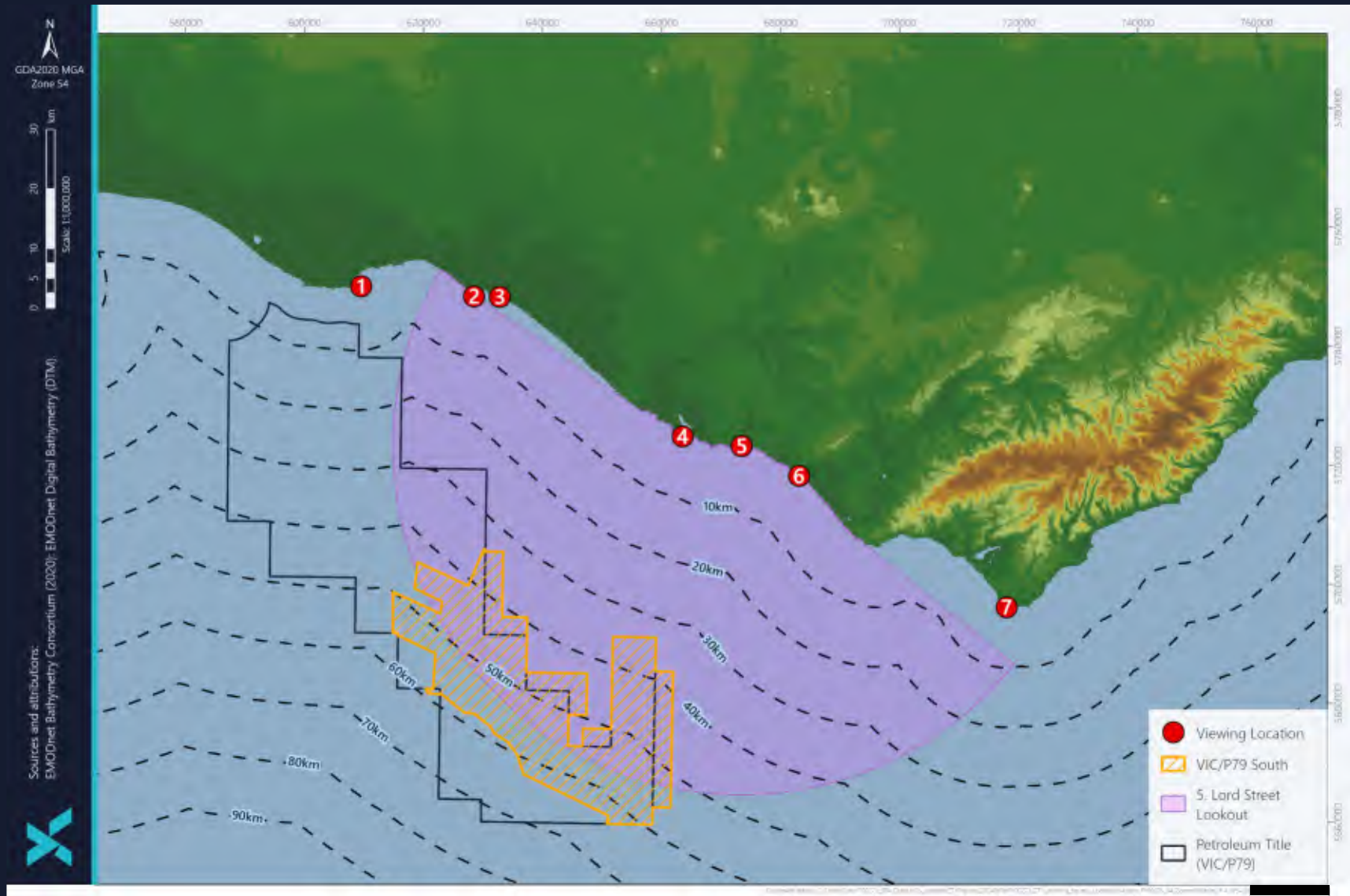


Site 4 viewshed for 85 m high object



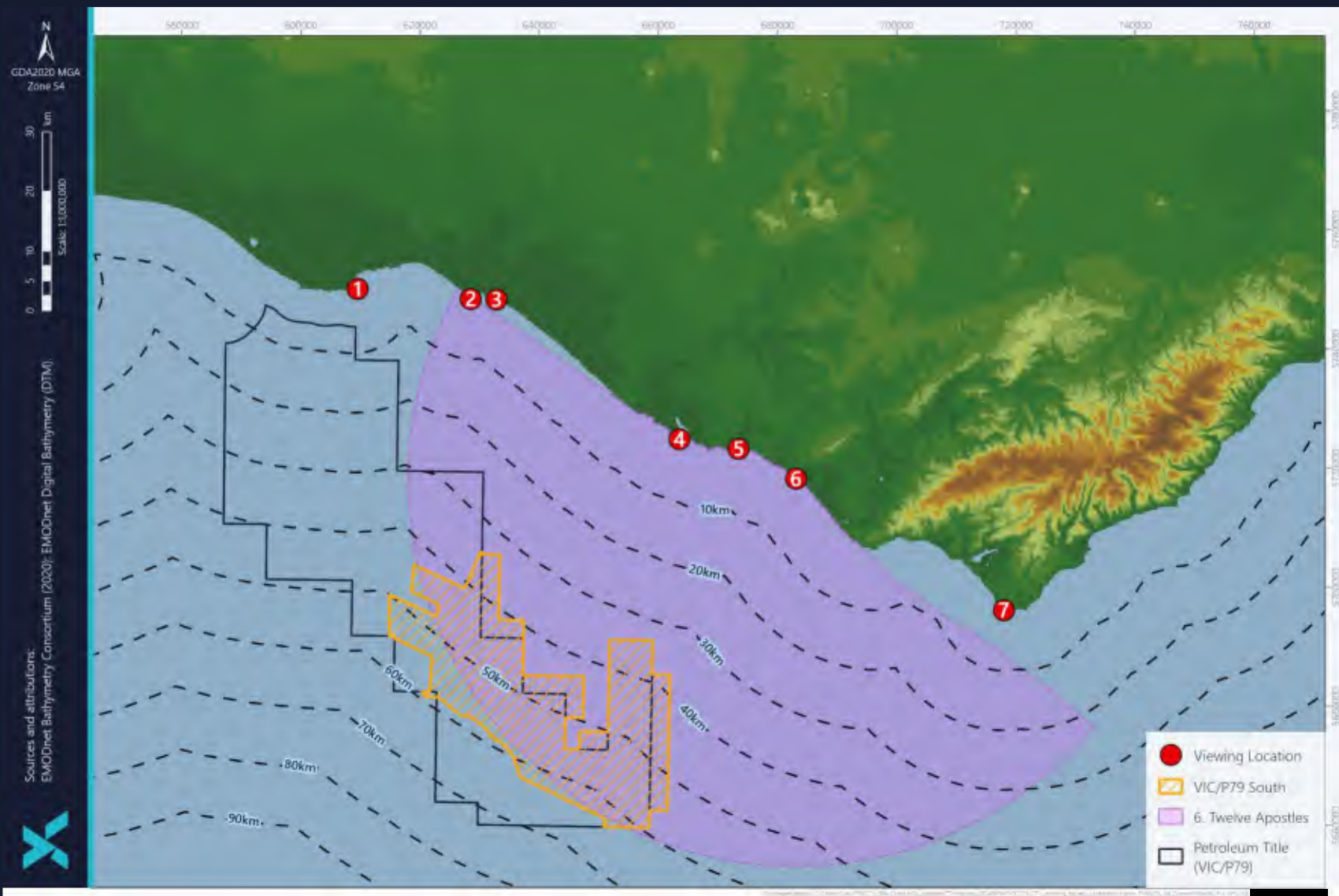


Site 5 viewshed for 85 m high object



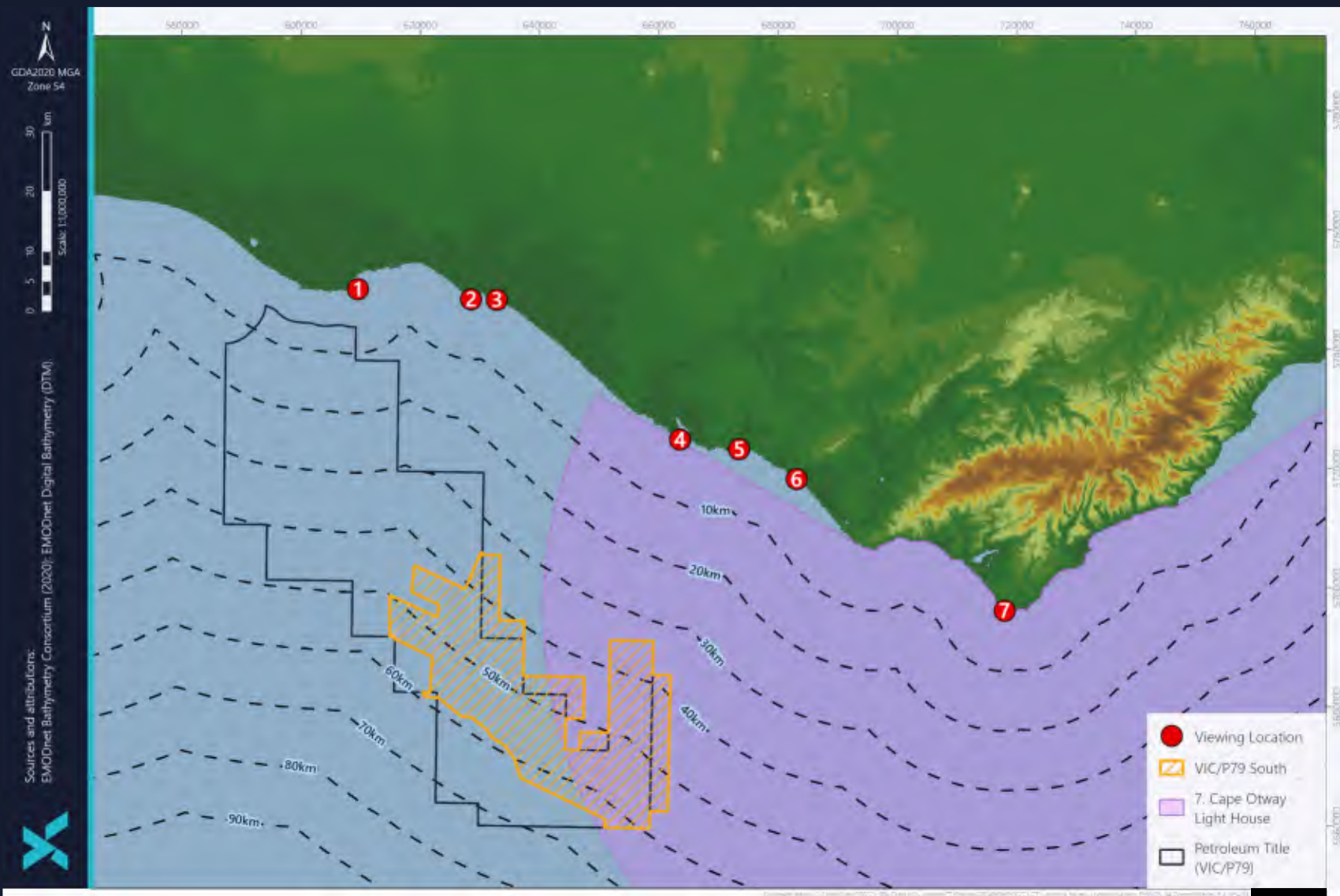


Site 6 viewshed for 85 m high object





Site 7 viewshed for 85 m high object

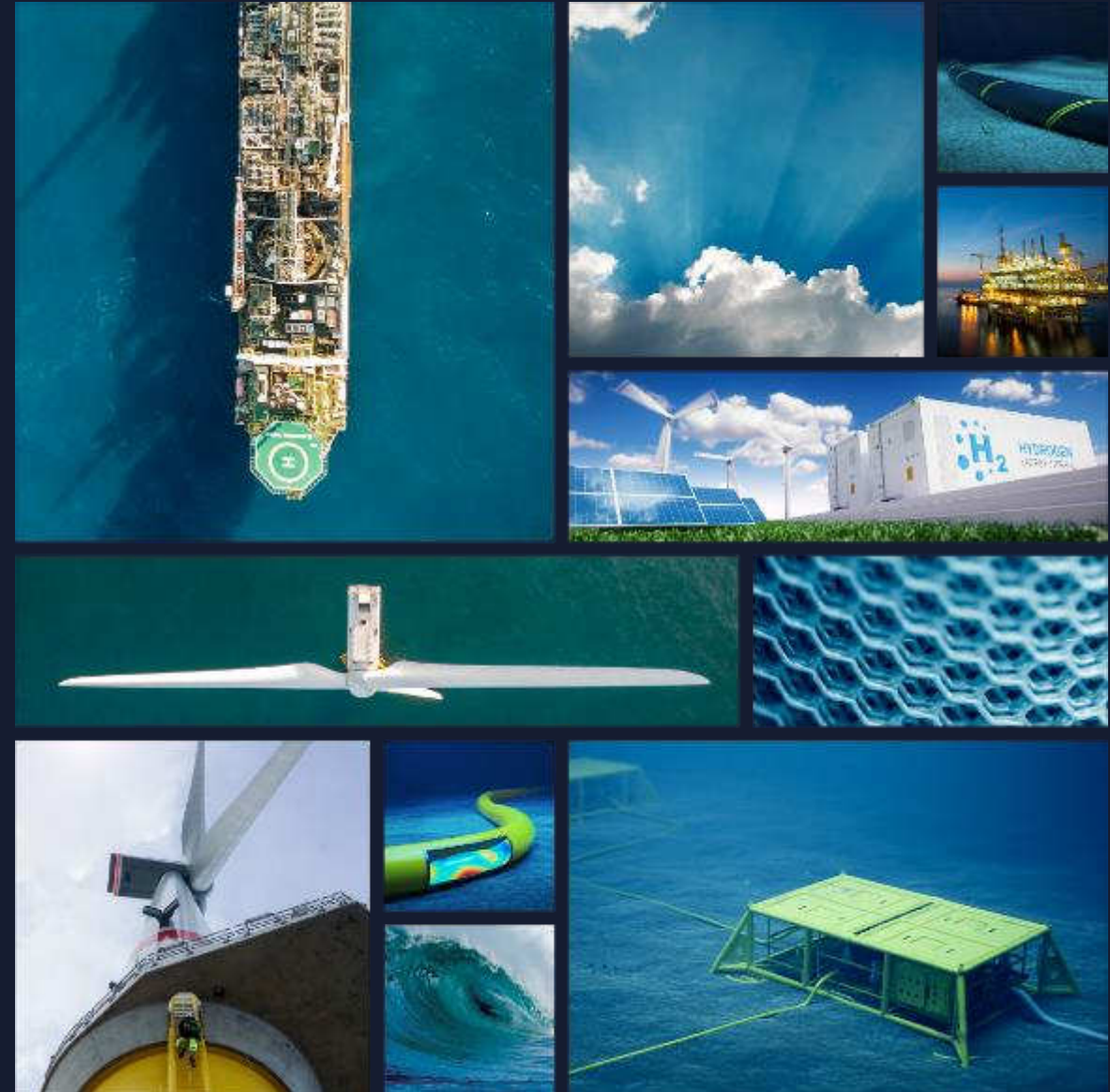




Zone of Theoretical Visibility (King Island)

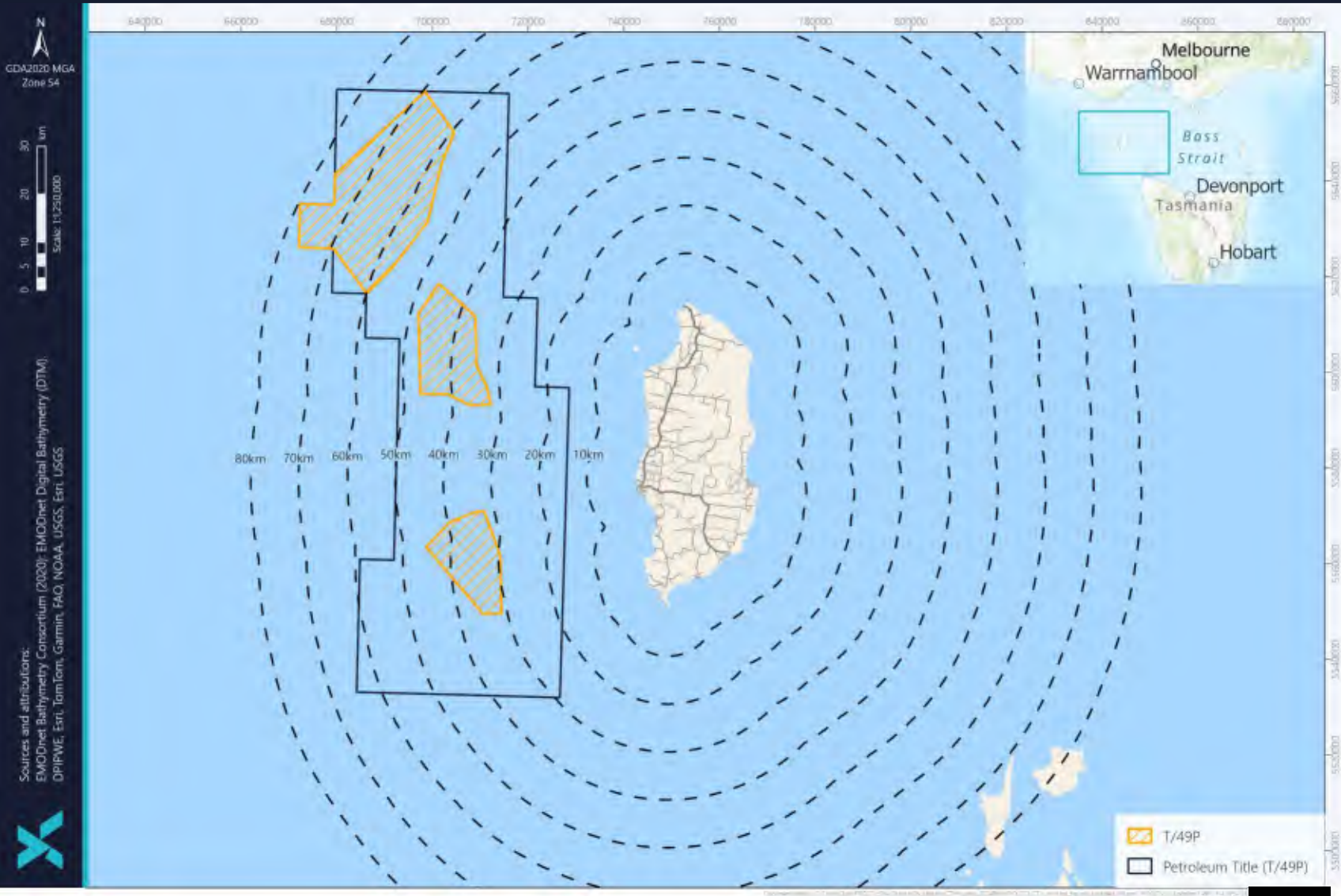
Geospatial visibility analysis of exploration activities within T/49P

WWW.XODUSGROUP.COM





King Island and Otway targets



King Island is situated in the Bass Strait, north west of Tasmania and south of Victoria.

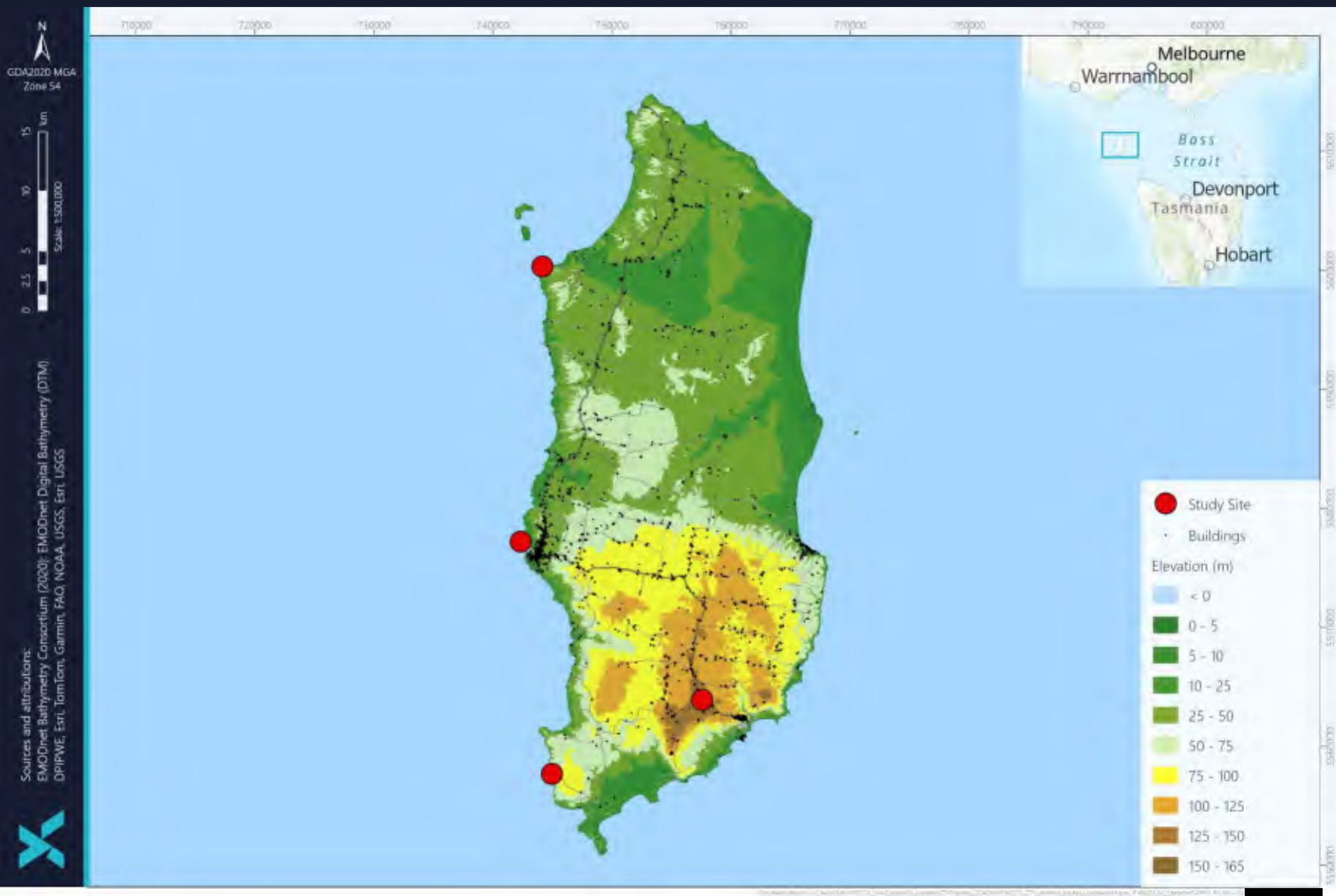
The Otway Exploration Drilling Campaign is located within Commonwealth waters in the Bass Strait, west of King Island.

The objective of this technical note is to present the outcomes of the assessment undertaken to estimate the Visual Impact from the campaign.

The study assess visibility of a platform from selected island locations.



King Island elevation and infrastructure



King Island has a relatively flat and low elevation northern half.

The southern region has a single main peak of approximately 162 m surrounded by rolling hills.

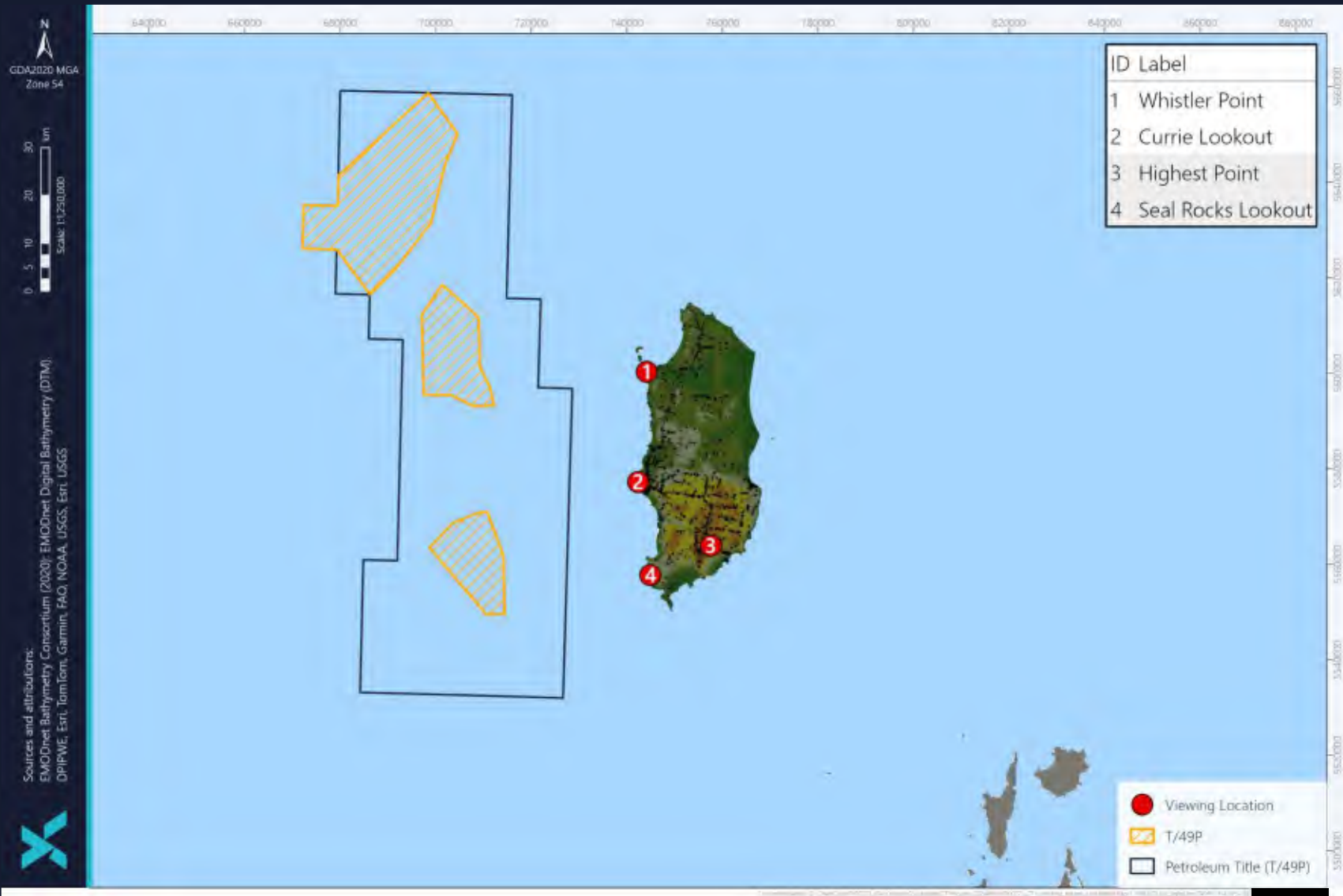
The main town is Currie, with two smaller villages of Grassy and Naracoopa.

Sources and attributions:
EMODnet Bathymetry Consortium (2020); EMODnet Digital Bathymetry (DTM);
DIPWE, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS





King Island viewing locations



For this study, four locations were chosen based on the following factors:

1. Elevation
2. Visual access
3. Tourism amenity
4. Proximity to a point of interest

Whistler Point

Site 1 is nearby to a coastal golf course and lighthouse. This site is conducive to tourism and visual amenity.

Currie Lookout

Site 2 is located above Devils Rock. This site was chosen due to elevation, visual access and proximity to the main town.

Highest Point

Site 3 is the highest point on King Island at approximately 160 m above sea level. The location itself is on private land approximately 200 m from the public road. This site is selected purely on elevation.

Seal Rocks Lookout

Site 4 is the main cliff top lookout on King Island. It is selected due to elevation, visual amenity and being a major tourist attraction.

Line of Sight Calculation

$$d = \left(2 \sqrt{\frac{4}{3}Rh_1 + h_1^2} \right)^{0.5} + \left(2 \sqrt{\frac{4}{3}Rh_2 + h_2^2} \right)^{0.5}$$

Where

- h_1 = height of object
- h_2 = height of receptor
- R = radius of earth
- d = total line of sight ($d_1 + d_2$)

Line of sight and Viewshed analyses are conducted using the standard calculation above.

The calculation determines a viewers (h) visible horizon limit (d_1). And if applicable, the observable distance of an object ($h_{receptor}$) beyond the horizon ($d_1 + d_2$).

As elevation/height of an observer increases, so does the distance to the horizon. Likewise, the viewable distance of an object beyond the horizon increases with it's elevation/height.

This assumes no adverse atmospheric conditions or obstructed field of view.



Calculated Viewshed

Label	Name	Elevation (m)	Horizon (km)	22 m Deck (km)	85 m Derrick (km)
1	Whistler Point	15	16	35	54
2	Currie Lookout	10	13	32	51
3	Highest Point	160	52	72	90
4	Seal Rocks Lookout	35	24	44	62

These values represent the inputs (Elevation) and outputs (Horizon or Platform) of the calculated visibilities.

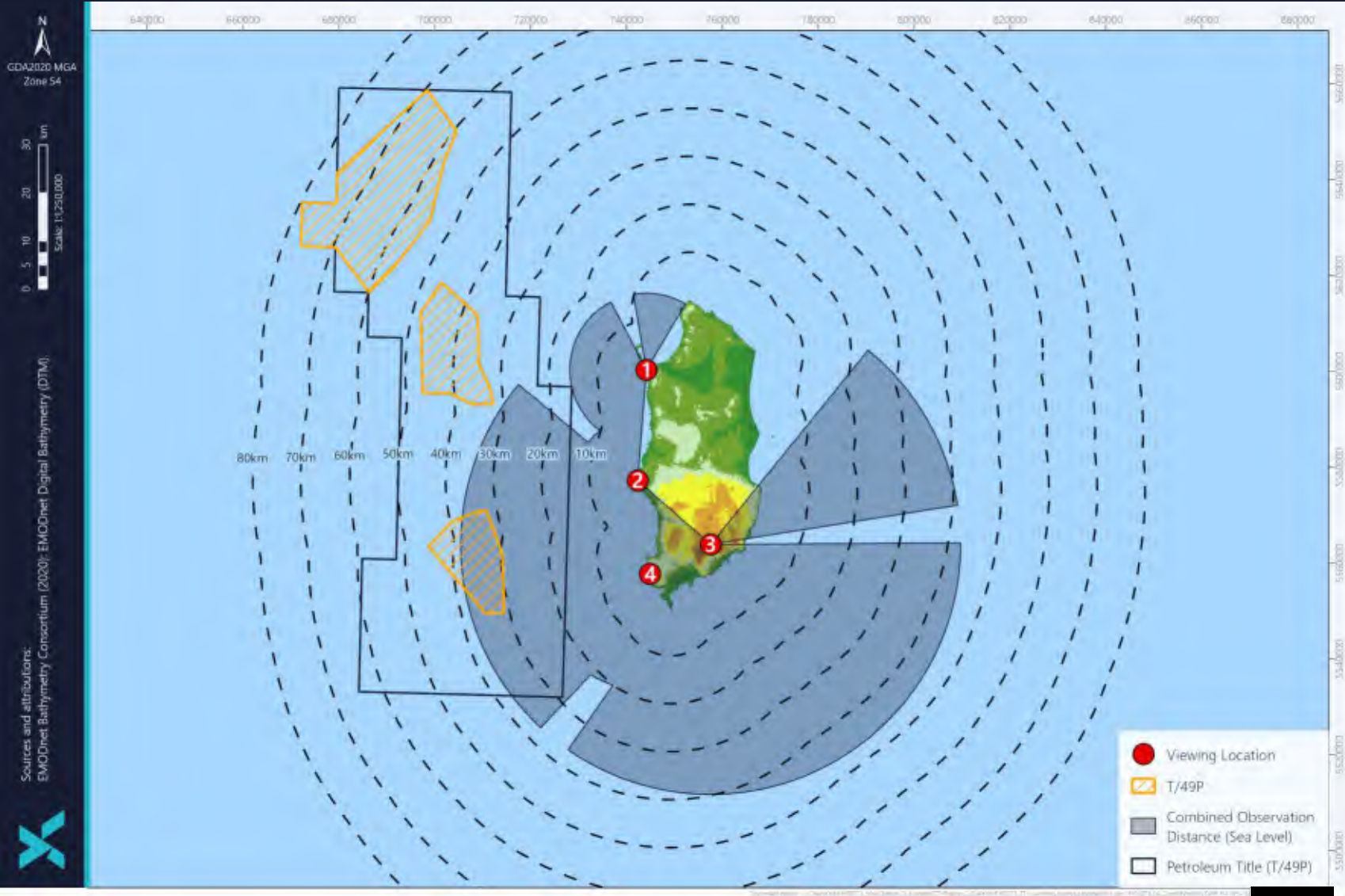
A 2 m tall observer at Seal Rocks Lookout (approximately 35 m above sea level) will see 24 km to the horizon. A 22 m high object will appear above the horizon to the observer up to 44 km away, and a 85 m high object will appear above the horizon up to 62 km away.

A main deck height of 22m and worst case scenario derrick height of 85 m has been used in this study. These represent the likely heights.

Each location's elevation has had 2 m added as the observers height.



King Island viewshed for Sea Level Horizon

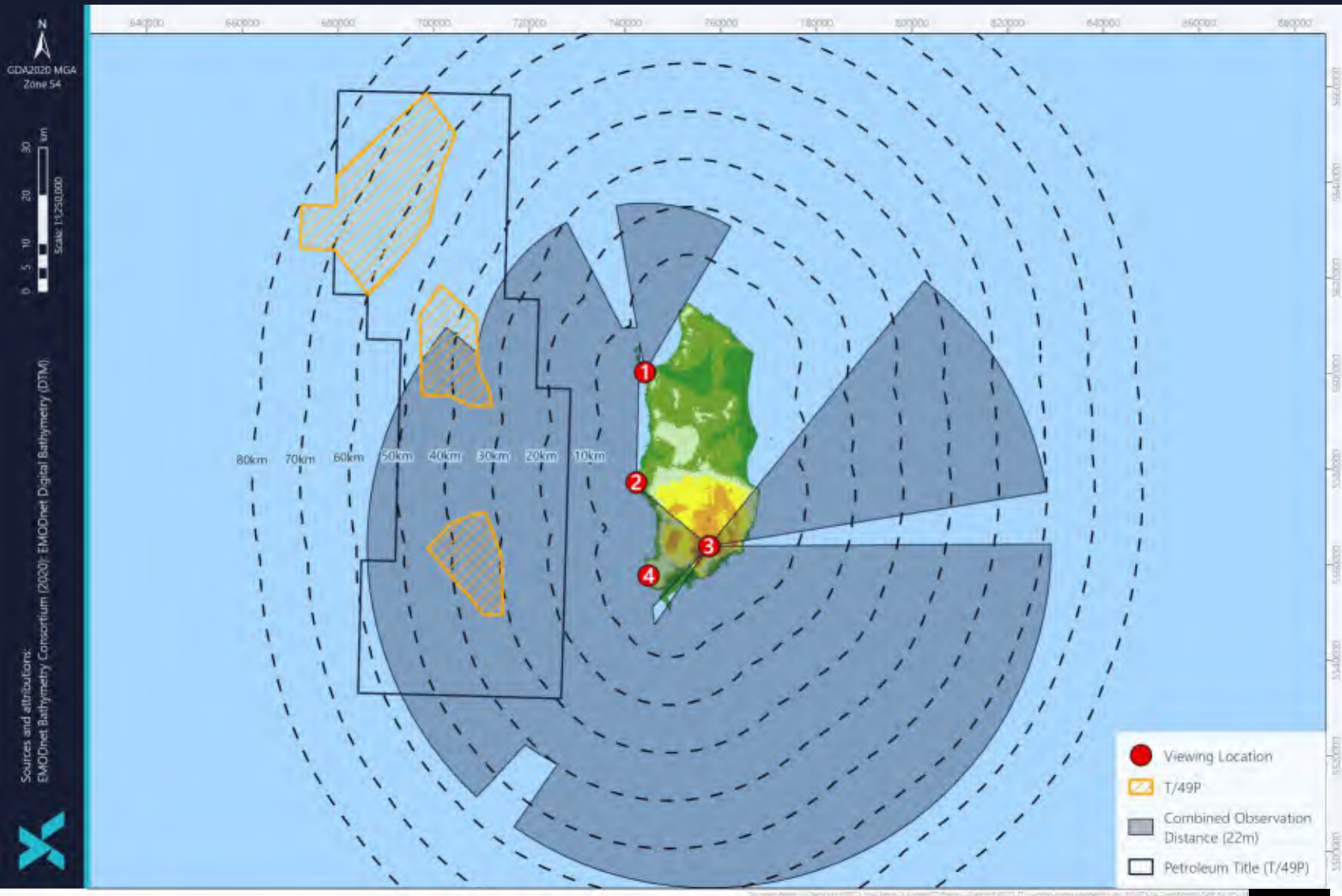


The fans of visibility represent the maximum viewable area from each location. As is demonstrated, the areas are dissected by local obstructions (islands and other landforms).

The most southern Otway target area is visible from 3 of the 4 viewing locations.



King Island viewshed for a 22 m high object



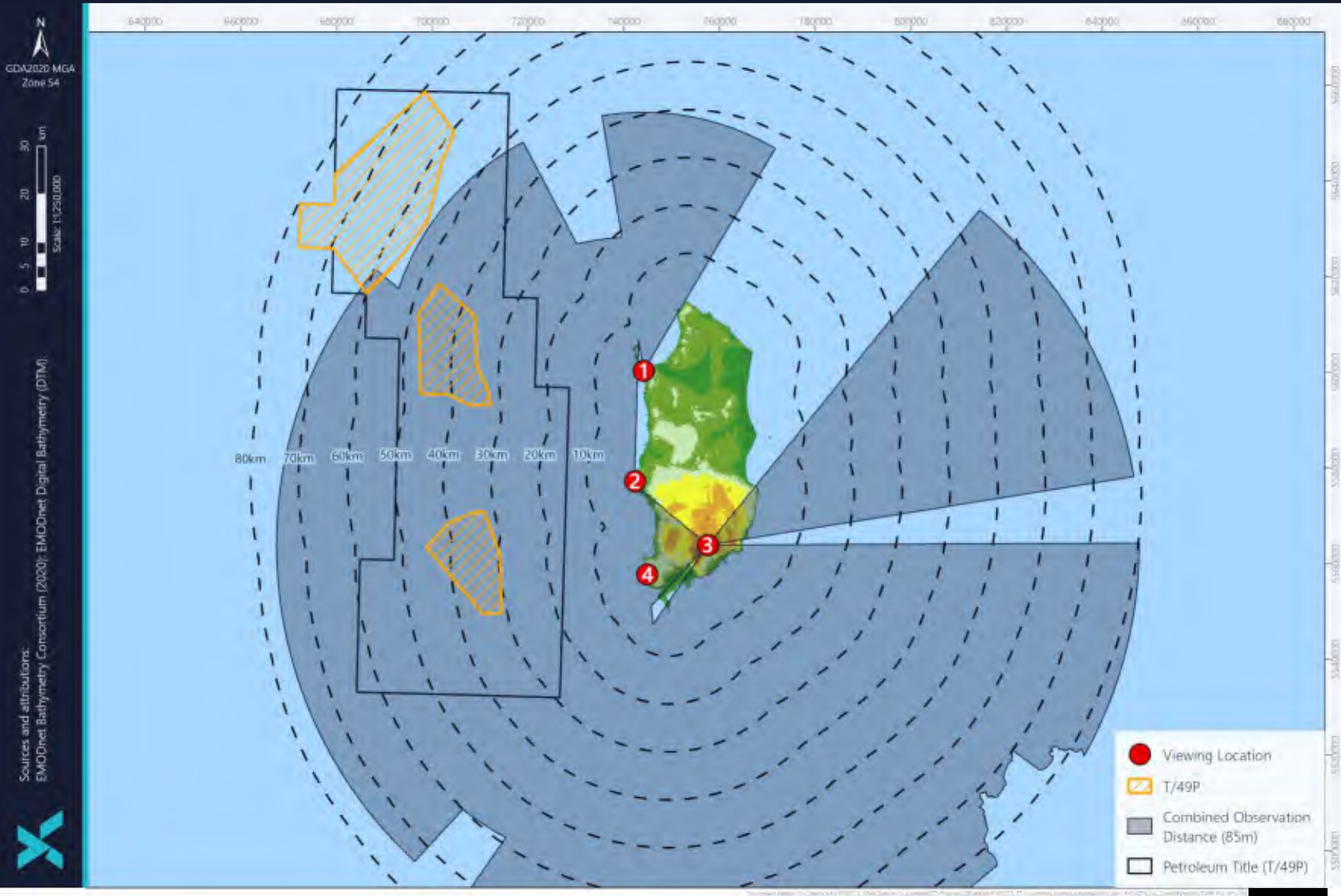
The fans of visibility represent the maximum viewable area of a 22 m high deck from each location.

An object 22 m high within the Otway target areas will be visible from all locations (see individual viewshed images).

The northern most Otway target area is can host a 22 m high deck and it will not be visible from any location.



King Island viewshed for a 85 m high object

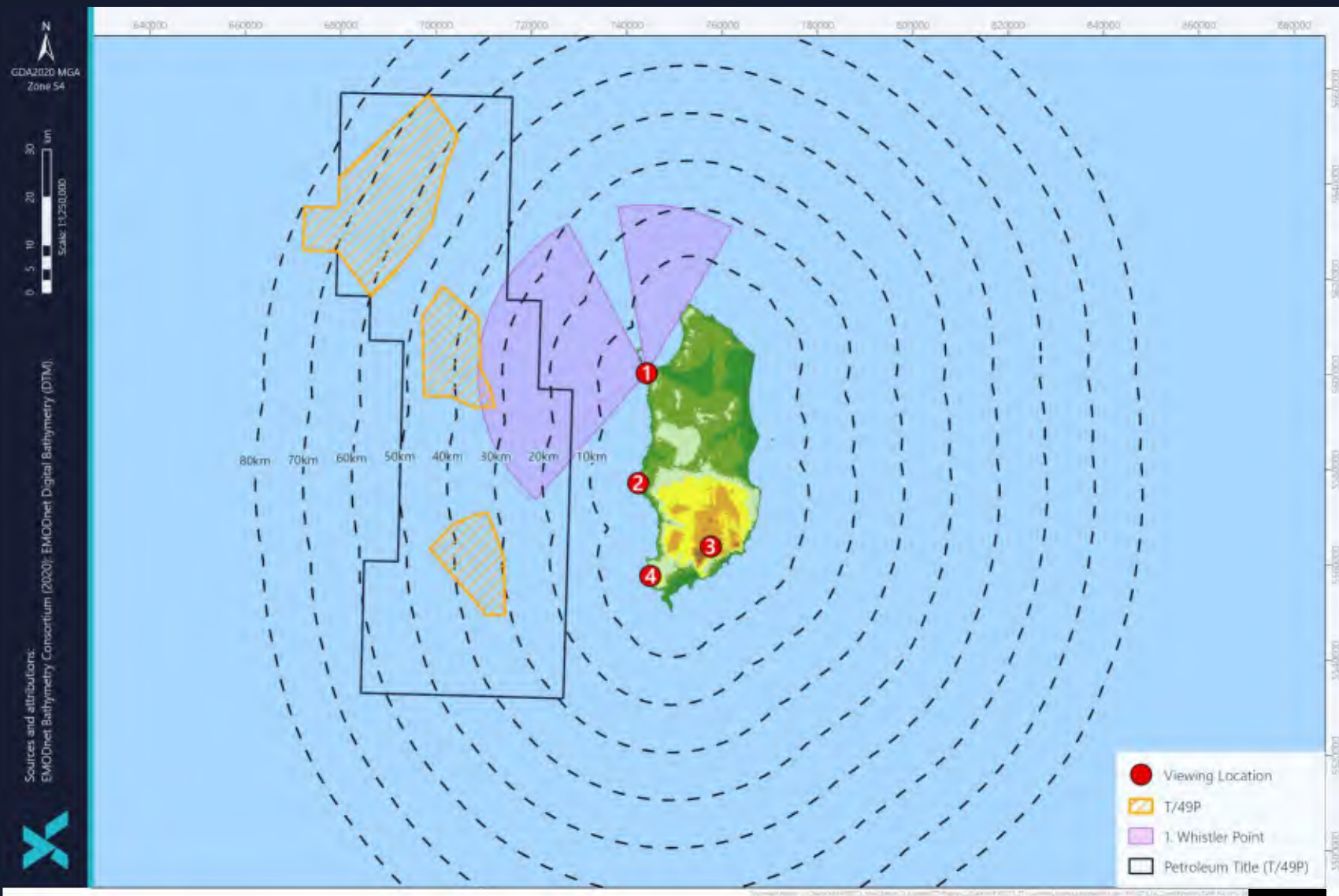


The fans of visibility represent the maximum viewable area of a 85 m high derrick from each location.

An object 85 m high within the Otway target areas will be visible from all locations (see individual viewshed images).

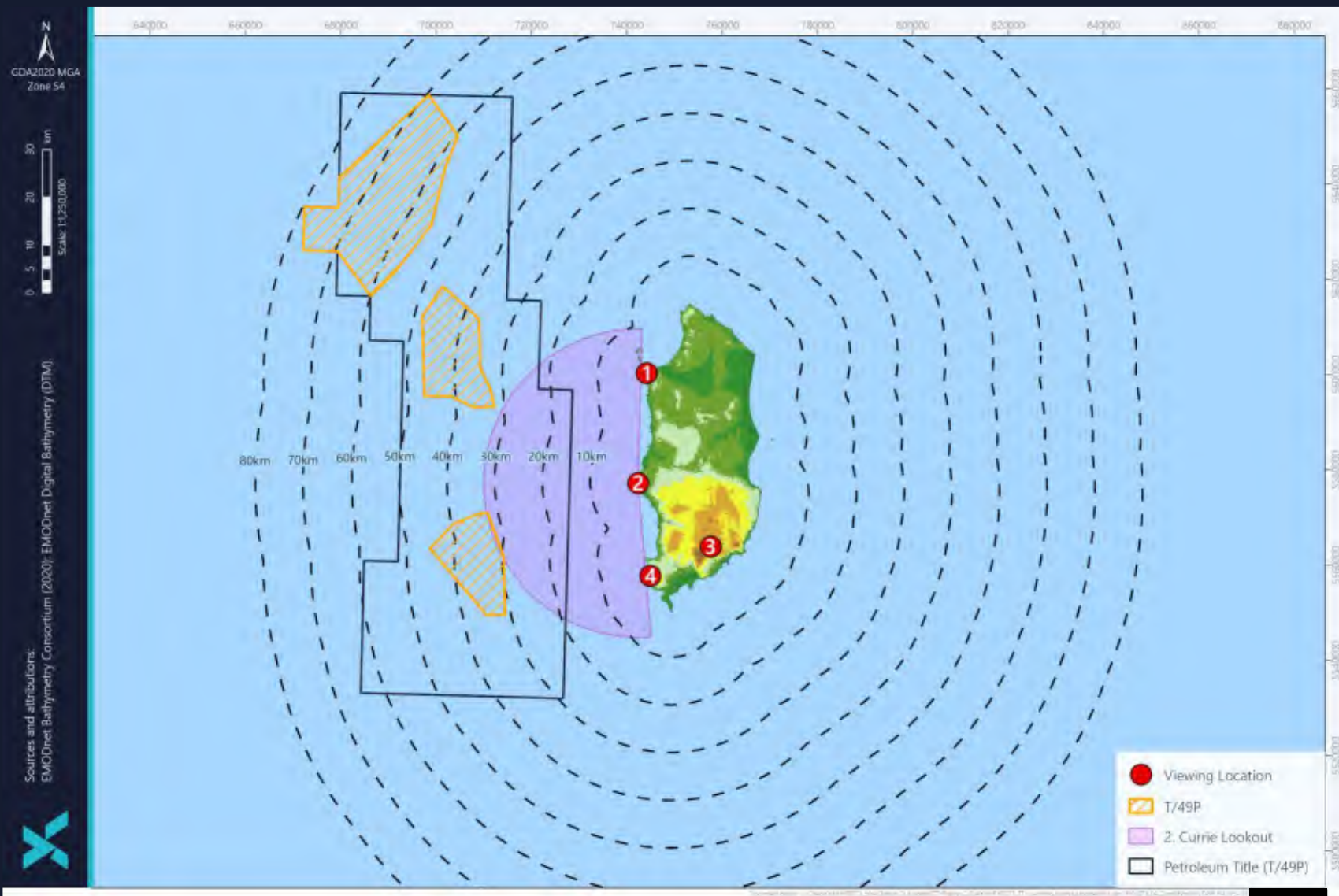


Site 1 viewshed for 22 m high object



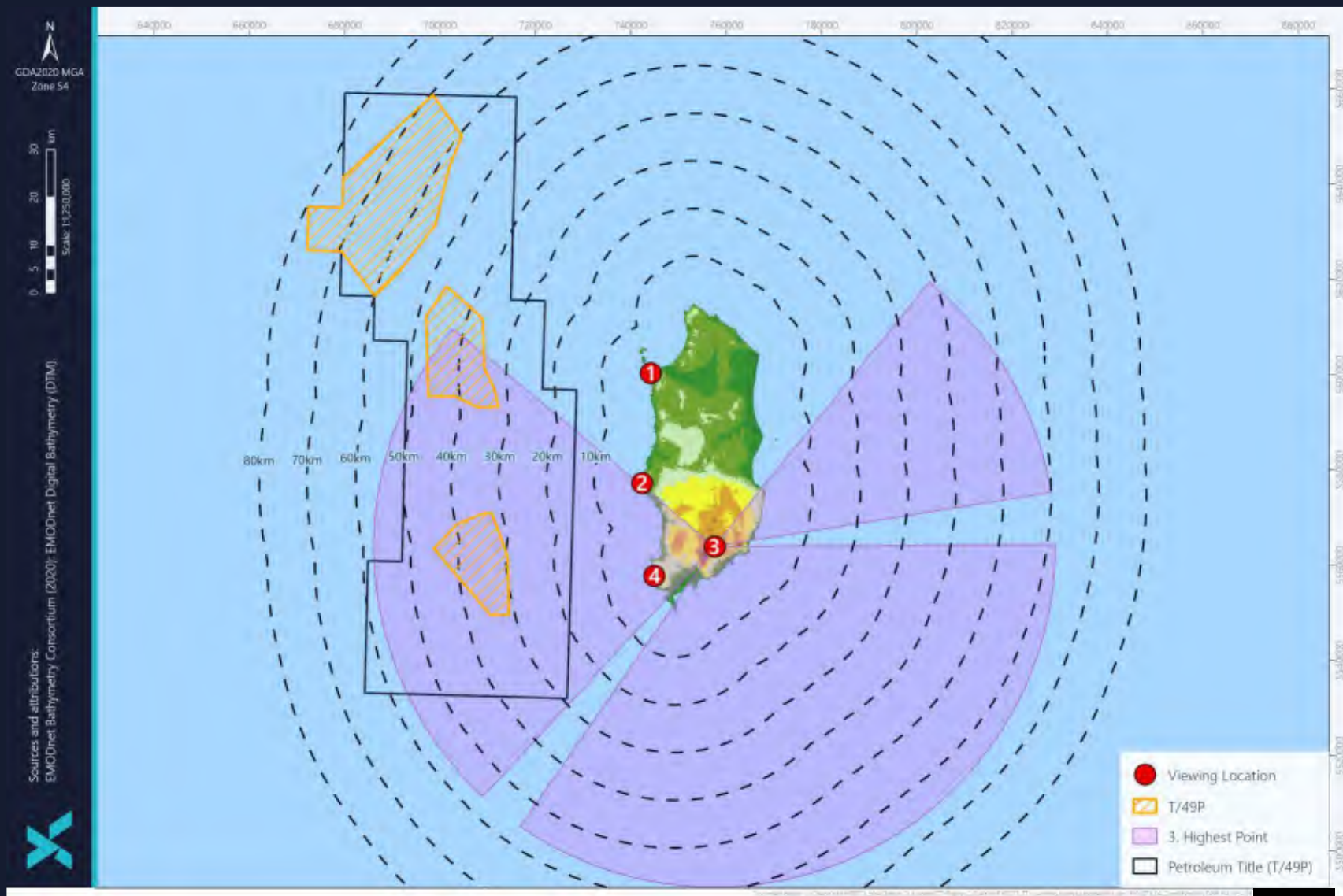


Site 2 viewshed for 22 m high object



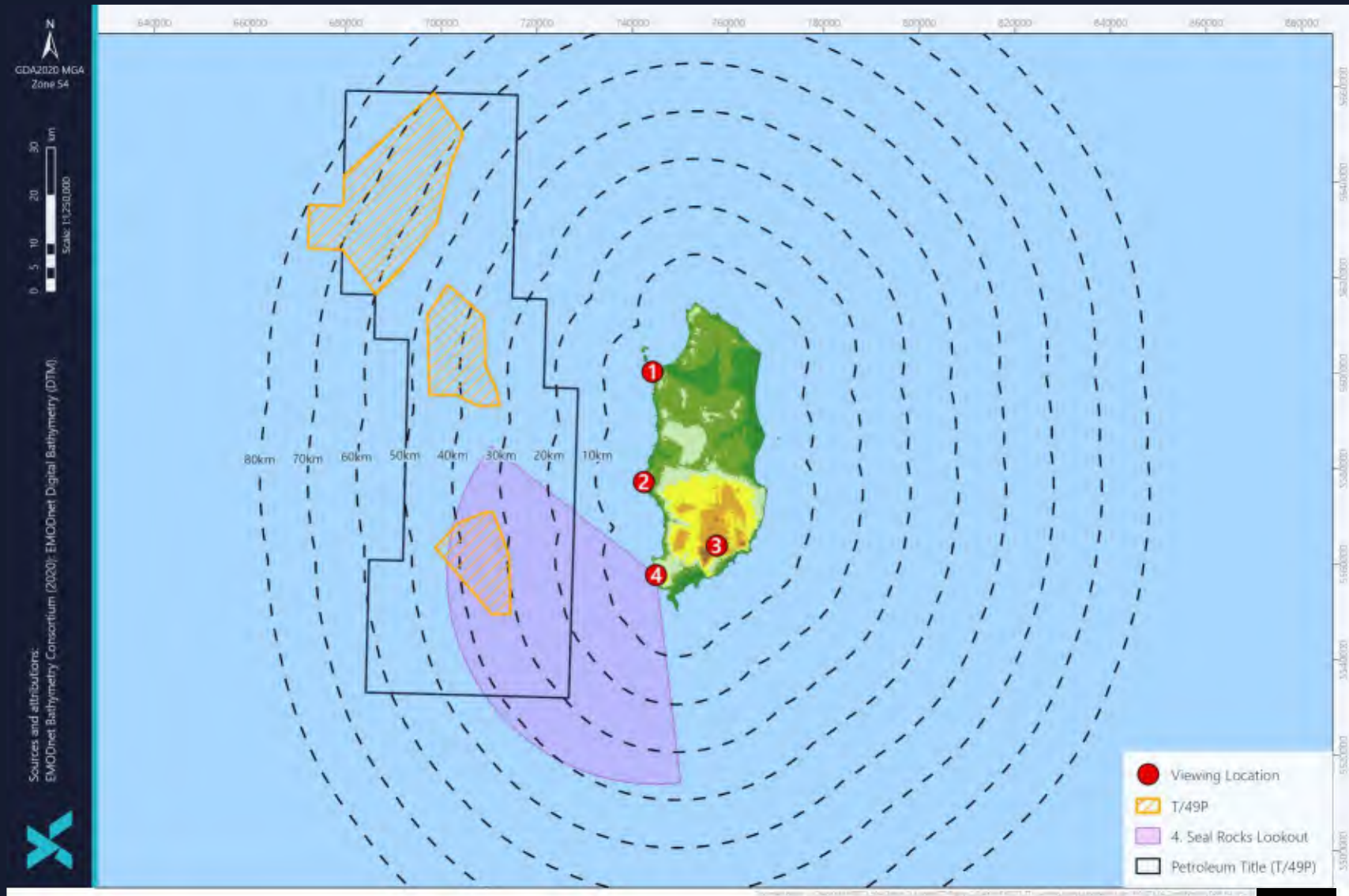


Site 3 viewshed for 22 m high object



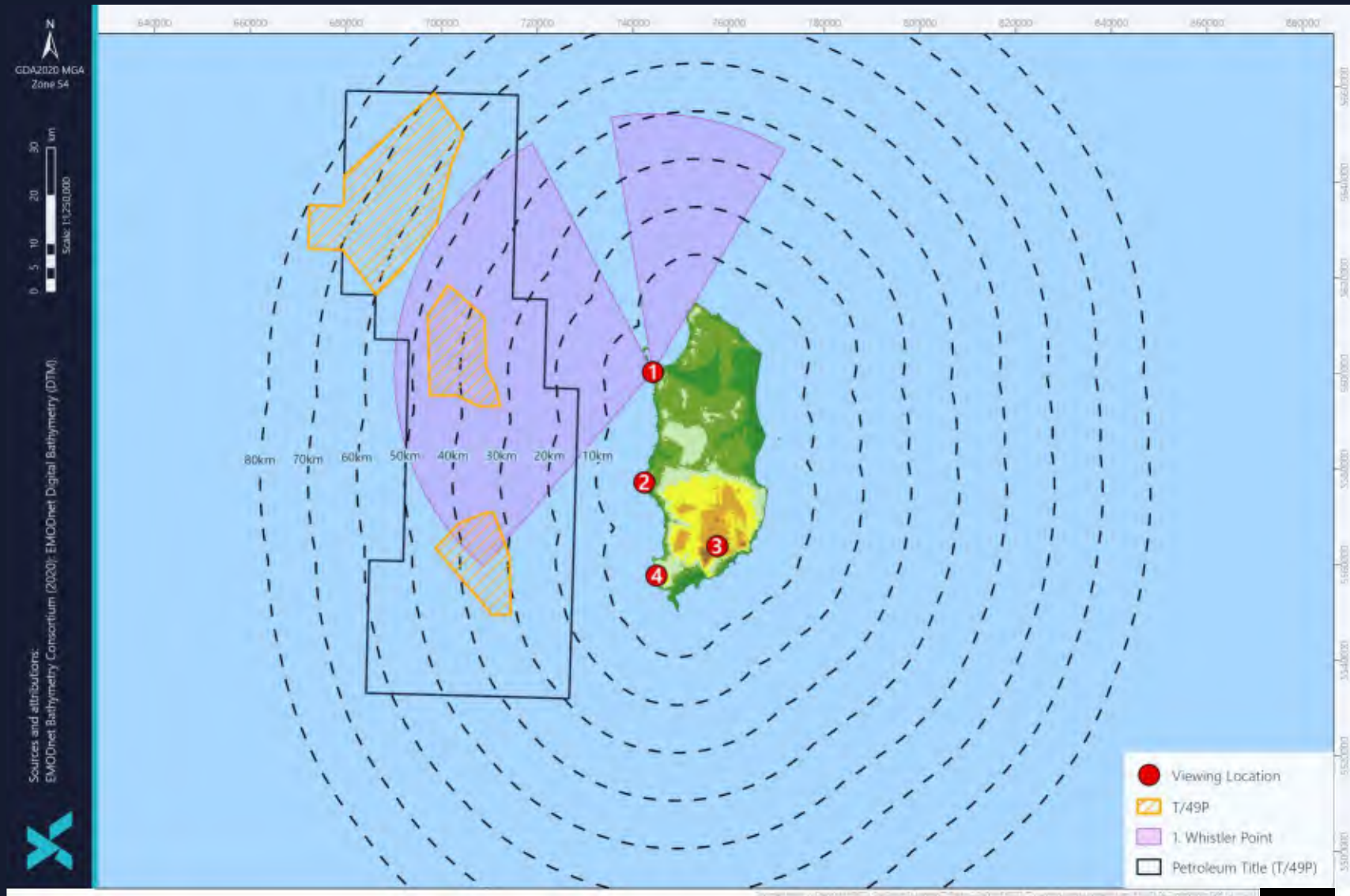


Site 4 viewshed for 22 m high object



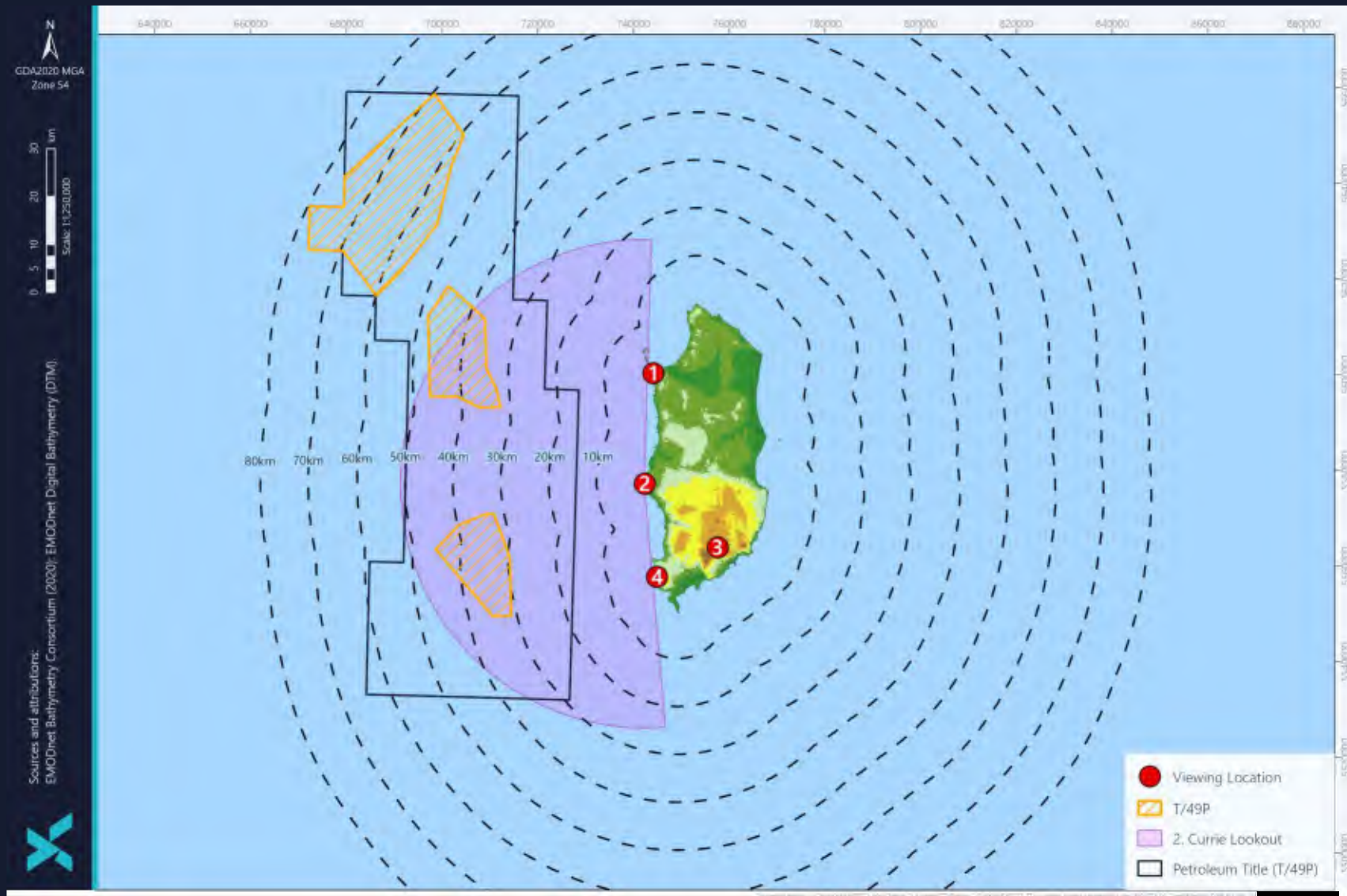


Site 1 viewshed for 85 m high object



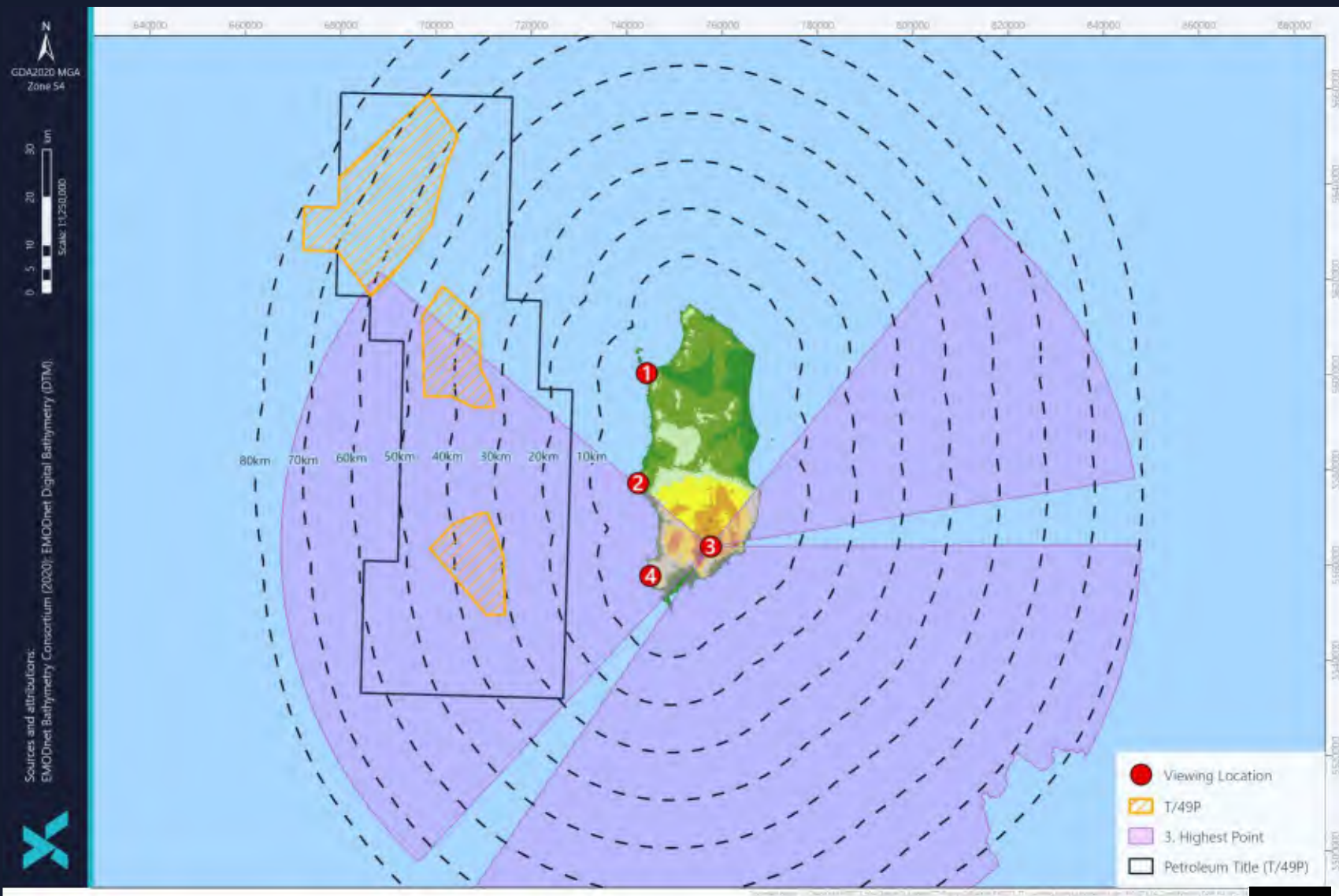


Site 2 viewshed for 85 m high object



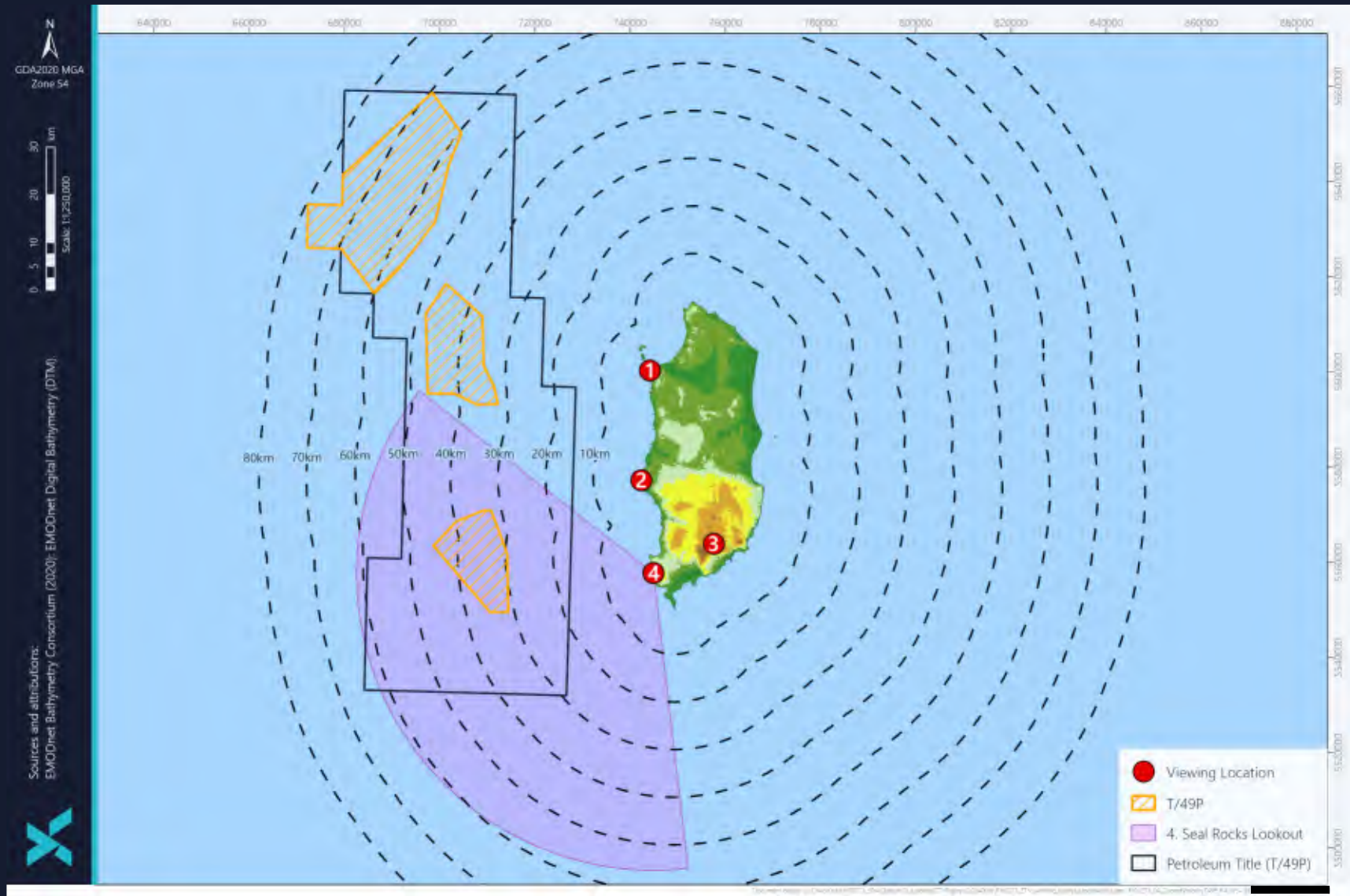


Site 3 viewshed for 85 m high object





Site 4 viewshed for 85 m high object



APPENDIX I OIL POLLUTION EMERGENCY PLAN (OPEP)

Appendix I provided as a separate document.

APPENDIX J AIR EMISSIONS ASSESSMENT



ConocoPhillips Australia

Otway Drilling - Detailed Assessment

Greenhouse Gas Emissions Technical Summary

ASSIGNMENT P100273-S02
DOCUMENT P-100273-S02-A-REPT-001



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C	05/05/2023	Issued for review	■	■	■	COP
B	28/03/2023	Issued for review	■	■	■	COP
A	22/12/2022	Issued for review	■			

REV	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED	CLIENT
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GREENHOUSE GAS EMISSIONS TECHNICAL SUMMARY

ConocoPhillips Australia is preparing to conduct an Otway Exploration Drilling Program, hereinafter referred to as the Activity, within permits T/49P and VIC/P79. An Environment Plan is currently being prepared based on the ‘design envelope’ which is a five-year timeframe from January 2024 to end 2028. In relation to the EP, this technical summary presents the worst-case and expected direct and indirect greenhouse gas (GHG) emissions estimate for the Activity.

The direct emissions refer to the GHG emissions emitted from sources owned or controlled by ConocoPhillips Australia (such as flaring and fugitive emissions); and the indirect emissions refer to the GHG emissions from sources not owned or controlled by ConocoPhillips Australia (such as embodied carbon of materials used). The boundary of assessment is shown in Table 1. The direct GHG emissions include flaring (no cold venting planned), with fugitive emissions assumed to be immaterial. The indirect GHG emissions include the emission sources from mobile offshore drilling unit (MODU), vessels, helicopters, and materials (only the major items – cement, casing/conductor and water-based drilling fluid (WBDF) considered).

The GHG emissions inventory for the Activity was calculated based on the methodology in the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Clean Energy Regulator, 2023). The input information and assumptions used are provided in the Appendix.

Table 1 : Boundary of assessment.

Activity	Surveys	Well Drilling and Testing	Plug and Abandonment
Direct GHG Emissions	<i>Inclusion(s):</i> -	<i>Inclusion(s):</i> • Flaring	<i>Inclusion(s):</i> -
	<i>Exclusion(s):</i> -	<i>Exclusion(s):</i> • Fugitives ¹	<i>Exclusion(s):</i> • Fugitives ¹
Indirect GHG Emissions	<i>Inclusion(s):</i> • Vessels (inc. ROV)	<i>Inclusion(s):</i> • MODU • Vessels • Helicopters • Materials ²	<i>Inclusion(s):</i> • MODU • Vessels • Helicopters • Materials ²
	<i>Exclusion(s):</i> • Employee commuting ¹	<i>Exclusions:</i> • Waste generated ¹ • Employee commuting ¹	<i>Exclusions:</i> • Waste generated ¹ • Employee commuting ¹

¹ Assumed immaterial.

² Materials refer to the major items – cement, casing/conductor, and water-based drilling fluid (WBDF).



As shown in Table 2, assuming worst-case conditions, for example the longest possible drilling duration for each well and maximum flaring duration and rates on each well, the total worst-case GHG emissions are estimated to be approximately 247 kt CO₂-e over the project life, consisting of 87 kt CO₂-e (35.0%) and 160 kt CO₂-e (65.0%) of the direct and indirect emissions, respectively. As shown in Figure 1, emissions from vessels, flaring, MODU, helicopters, and materials represent 36.7%, 35.0%, 21.1%, 0.6%, and 6.6% of the total emissions, respectively. The total GHG emissions estimate is approximately 0.01% of the Australian carbon budget, for the duration of the Activity (Department of Climate Change, Energy, the Environment and Water, 2022).

Table 2: Summary of worst-case estimated GHG emissions.

Emission source	Total GHG Emissions (t CO ₂ -e)	Percentage
Direct emissions:	86,500	35.0%
Flaring	86,500	35.0%
Indirect emissions:	160,500	65.0%
Vessels	90,600	36.7%
MODU	52,000	21.1%
Helicopters	1,500	0.6%
Materials	16,300	6.6%
TOTAL	247,000	100%

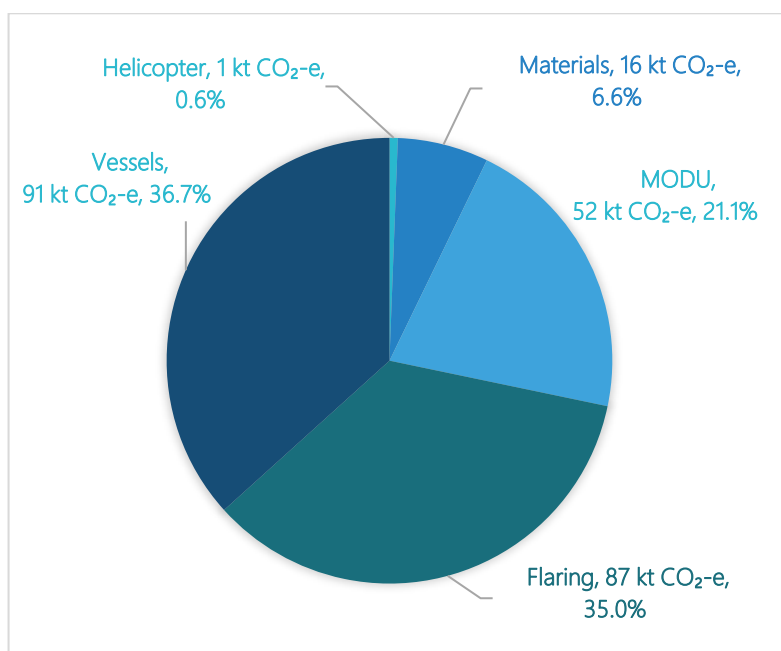


Figure 1: GHG emissions by source under worst-case conditions.



As shown in Table 3, assuming more realistic operational conditions, for example typical drilling duration and well testing on only two wells at maximum duration and rates the total expected direct and indirect GHG emissions are estimated to be approximately 106 kt CO₂-e over the project life, consisting of 29 kt CO₂-e (27.2%) and 77 kt CO₂-e (72.8%) of the direct and indirect emissions, respectively. As shown in Figure 2, emissions from vessels, flaring, MODU, helicopters, and materials represent 41.7%, 27.2%, 21.8%, 0.6% and 8.7% of the total emissions, respectively. The total GHG emissions estimate is approximately 0.005% of the Australian carbon budget, for the duration of the Activity (Department of Climate Change, Energy, the Environment and Water, 2022).

Table 3: Summary of expected estimated GHG emissions.

Emission source	Total GHG Emissions (t CO ₂ -e)	Percentage
Direct emissions:	28,900	27.2%
Flaring	28,900	27.2%
Indirect emissions:	77,200	53.8%
Vessels	44,200	41.7%
MODU	23,100	21.8%
Helicopters	700	0.6%
Materials	9,200	8.7%
TOTAL	106,100	100%

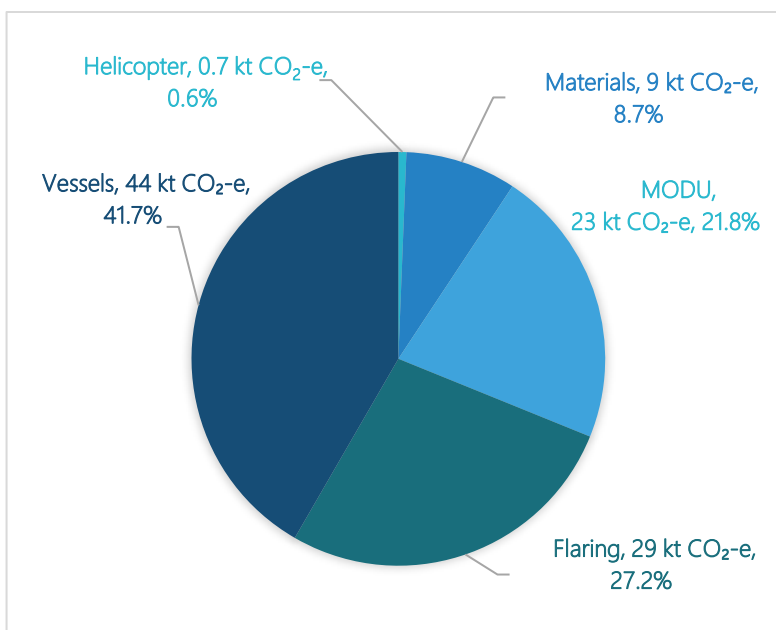


Figure 2: GHG emissions by source under realistic operational conditions.



REFERENCES

2023, Clean Energy Regulator, Australian Government, Measurement Determination, <https://www.cleanenergyregulator.gov.au/NGER/Legislation/Measurement-Determination> (Assessed on 23/1/2024)

2022, Department of Climate Change, Energy, the Environment and Water, Australian Government, Australia's emissions projections 2022, URL: <https://www.dcceew.gov.au/climate-change/publications/australias-emissions-projections-2022#:~:text=The%20revised%202030%20commitment%20is%20both%20a%20single-year,budget%20for%20this%20period%20is%204%2C381%20Mt%20CO%E2%82%82-e> (accessed on 23 January 2024).



APPENDIX

Input information used:

1. The well drilling and testing phase, including the plug and abandonment, will take 540 days in total, equivalent to maximum drilling days of 90 per well for 6 wells under worst-case operational conditions; and 240 days in total, equivalent to drilling days of 40 per well for 6 wells under realistic operational conditions.
2. Vessels moving to or residing outside the operational area are not considered part of the Activity. Vessel activities within the operational area is considered in this inventory.
3. Amount of vented gas is negligible and therefore excluded.
4. Helicopters will be the only aircraft used. There are on average two helicopters, each with a flight frequency of four times a week, flying from the Port of Warrnambool during well drilling and testing (including plug and abandonment phase). A one-way distance of 125 nm was used in calculation of helicopter emissions.
5. Maximum flare rate is 40 MMscfd for 120 hours/well during well drilling and testing. Under worst-case operational conditions, well testing applied on all 6 wells; and under realistic operational conditions, well testing applied on only 2 wells.
6. No flaring during plug and abandonment activities.
7. No fuel gas or purchased electricity is to be used.
8. Resupply operations will be done by one supply vessel, at a frequency of 2 port calls per week, with 1 day in port.

Assumptions used:

1. Vessels and MODU details used in calculation are shown in Table A1.
2. Major items required for well drilling assumed to be 1151~1601 bbl of cement per well, 2978~4851 bbl of WBDF per well, and 287~530 t of corrosion resistant alloys (CRA casing)/well.
3. Immaterial emissions from waste generated and employee commuting.

Table A1: Vessels and MODU input used in calculation.

VESSELS	QUANTITY	NO. OF TRANSIT DAYS (WITHIN OPERATIONAL AREA)	NO. OF WORKING DAYS UNDER WORST-CASE CONDITIONS	NO. OF WORKING DAYS UNDER REALISTIC CONDITIONS
Survey:				
Geotechnical vessel with ROV	1	3	63	63
Survey vessels	1	3	63	63
Well drilling and testing, including plug and abandonment:				
MODU	1	-	540	240
AHTS	2	3	540	240
PSV	1	3	540	240

(ROV: remotely operated vehicle; MODU: Mobile offshore drilling unit; AHTS: Anchor handling tug supply vessel; PSV: platform supply vessel)

APPENDIX K UXO CONTAMINATION REPORT

DESK STUDY FOR POTENTIAL UXO CONTAMINATION OTWAY EXPLORATION DRILLING

Risk Assessment and Mitigation Strategy



Report Ref: EES1447
Report Number: R-01-01

Desk Study for Potential UXO
Contamination – Otway
Exploration Drilling

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DESK STUDY FOR POTENTIAL UXO CONTAMINATION

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ABBREVIATIONS

Abbreviation	Definition
AAA	Anti-Aircraft Artillery
ALARP	As Low As Reasonably Practicable
AOI	Area of Interest
CPT	Cone Penetration Test
EMC	German Type C moored contact mine
EOD	Explosive Ordnance Disposal
GIS	Geographical Information System
GU	German EMA mine
GY	German EMC/EMG mine
HE	High Explosive
HIRA	Hazard Identification and Risk Assessment
ID&C	Identification and Clearance
km	Kilometre
LAT	Lowest Astronomical Tide
m	Metres
mm	Millimetres
MoD	Ministry of Defence
OSPAR	Convention for the Protection of the Marine Environment of the North East Atlantic
PEXA	Practice and Exercise Areas
SAA	Small Arms Ammunition
WWI	World War One
UXO	Unexploded Ordnance
WWII	World War Two

EXECUTIVE SUMMARY

Background

RPS Explosives Engineering Services (RPS), part of RPS Energy Ltd, has been commissioned by **ConocoPhillips** to conduct a desktop study and risk assessment for potential Unexploded Ordnance (UXO) contamination at the **Otway Exploration Drilling** site. This document will provide an overview and easy access to future operations in respect of UXO risk handling for all potential upcoming drilling works.

The principal aim of RPS, for this report, is to provide **ConocoPhillips** with an appropriate and pragmatic assessment of the risks posed by UXO to the **Otway Exploration Drilling**, in order to identify a suitable methodology for the mitigation of any identified risks to an acceptable level in accordance with the 'ALARP' Principle.

The Area of Interest (AOI) is the **Otway Exploration Drilling** Permit Areas VIC/P79 and T/49P. These permit areas are located in the Otway Basin, between Warrnambool, Victoria and King Island. Permit Area VIC/P79 covers an area of approximately 2576 km², whilst Permit Area T/49P covers an area of approximately 4690 km².

UXO Risk Level

The Risk Levels identified in this study are based upon Probabilities of Encounter which have been determined for the provided Scope of Works (i.e. a limited number of wellsite drilling and seabed survey locations) which, due to the limited nature of interaction with the seabed are lower overall than those for the entirety of the Permit Areas. If the client were to conduct extensive further works, RPS must be consulted so that the risk posed by the additional interaction with the seabed can be assessed.

Based on the conclusions of the research and the risk assessment undertaken, RPS has found there to be a **Low** risk from encountering UXO on site.

RPS also take in to account the category of UXO both when assessing the probability of the item functioning and the consequence of such an event. This leads to the varying risk levels between munitions with the same installation methodology. The full risk matrices are presented in **Appendix 6**, providing an assessment of the risk associated with each activity.

The Permit Areas have been split into 4 zones (A-D), dependent on the risk presented and the planned installation activities.

Table 0.1 - Overall Risk Levels

Overall Risk Levels					
UXO		Risk Zones			
		A	B	C	D
Small Arms Ammunition		Neg	Neg	Neg	Neg
Land Service Ammunition		Neg	Neg	Neg	Neg
≤155 mm Projectiles		Neg	Neg	Neg	Neg
>155 mm Projectiles		Neg	Low	Low	Neg
HE Bombs	Allied Origin	Low	Low	Low	Low
	Axis Origin	Neg	Neg	Neg	Neg
Sea Mines	Allied Origin (Contact Mine)	Low	Low	Low	Low
	Allied Origin (Ground Mine)	Low	Low	Low	Low
	Axis Origin (Contact Mine)	Low	Low	Low	Low
	Axis Origin (Ground Mine)	Low	Low	Low	Low
Torpedoes		Low	Low	Low	Low
Depth Charges		Low	Low	Low	Low
Conventional Dumped Munitions		Low	Low	Low	Low
Dumped Chemical Munitions		Low	Low	Low	Low
Missiles/Rockets		Low	Low	Low	Low

Burial

In the softer sediments, it is possible for munitions to be covered by shifting sediments on the seabed and subsequently become buried. This is dependent on the mass, dimensions/shape of the item and the sediments upon which it came to rest as well as the currents affecting the area, however the maximum burial depth due to scour is approximately equal to the diameter of the munition. Burial is not possible in areas where bedrock is exposed.

Given the water depths throughout the site, it is considered likely that burial via natural processes (i.e. mobile seabed) will be the main form of burial rather than burial as a direct result of penetration upon impact.

RPS have determined that any UXO present on site is likely to be buried to scour depth (approximately equal to the diameter of the munition) plus the wave height of any mobile sediment bedforms present.

Recommendations

Based on the identified risk levels, it is recommended that appropriate mitigation is implemented to reduce the risk, prior to and/or during any works.

Due to the Low-Risk present at the wellsite locations, it would be recommended that Reactive Mitigation is used to manage the residual risk on site. It would be recommended that for all risk areas and activities that at a minimum all personnel are provided an **Explosives Safety and Awareness Briefing**.

The Moderate Risk associated with Snag on Vessel is also mitigated using Reactive Mitigation.

Table 0.2 - Risk Mitigation Strategy Overview

Risk Zone	Activity / Risk Level*	Mitigation Requirement					
		UXO Survey	Avoidance and / or ID&C	Explosives Safety Briefing	Explosives Engineer on Vessel**	Explosives Engineer On-Call	Detection Requirement
A	Low Risk Activities			✓		✓	N/A
B	Low Risk Activities			✓		✓	N/A
C	Low Risk Activities			✓		✓	N/A
D	Low Risk Activities			✓		✓	N/A

* See Table 6.2 for risk level of each activity in each risk zone

** Dependent on Survey Results

For further information about Reactive Mitigation requirements see Section 11

1 INTRODUCTION

1.1 Instruction

RPS Explosives Engineering Services (RPS), part of RPS Energy Ltd, has been commissioned by **ConocoPhillips** to conduct a desktop study and risk assessment for potential Unexploded Ordnance (UXO) contamination at the **Otway Exploration Drilling** site. This document will provide an overview and easy access to future operations in respect of UXO risk handling for all potential upcoming drilling works.

A site location map has been presented in **Appendix 1**.

1.2 Scope of Work

The following facets will be covered within this report:

- **UXO Risk Analysis:** Assessment of the specific military, former military and UXO related activities that have taken place within the vicinity of the project area. Additionally, to review any previous UXO clearance/mitigation operations that have already taken place. Then, to assess the risks which the identified UXO types present to the installation/survey activities.
- **Recommendations:** Based on the outcome of the assessment, appropriate mitigation measures that have been recommended to allow works to proceed safely and with minimal disruption. The recommendations will be designed to reduce the risk on site to As Low As Reasonably Practicable ('ALARP').

This report focuses on historical activities that occurred within the proposed Area of Interest and its immediate surroundings, with respect to the likelihood of encountering potential UXO and any associated risk with the proposed scheme of work.

1.3 Definitions

The term 'Site' refers to the area within the extent of the works associated with the **Otway Exploration Drilling**, illustrated in **Appendix 1**.

The term '**Area of Interest (AOI)**' refers to the area within the extent of the works associated with the site. This is defined by the client-provided ArcGIS shapefile "COP_Permits_Otway.shp".

The term "**Area of Interest Buffer**" is a 5 km buffer surrounding the AOI. Due to the degree of inaccuracy when plotting historical munitions this buffer is used to aid in determining the probability of encountering UXO within the site.

The term "**Wider Area of Interest**" is an undefined area outside of the AOI in which some of the information detailed in this report may relate to, to outline the overall military history of the area

Selected terminology referred to throughout this report is documented in **Appendix 2**.

1.4 Aims

The principal aim of RPS, for this report, is to provide **ConocoPhillips** with an appropriate and pragmatic assessment of the risks posed by UXO to the **Otway Exploration Drilling**, in order to identify a suitable methodology for the mitigation of any identified risks to an acceptable level in accordance with the 'ALARP' Principle.

The 'ALARP' Principle is clearly defined in **Appendix 3**.

1.5 Reporting Conditions

This study consists of a desk-based collation and review of available documentation and records relating to the possibility of UXO being present within the site. Certain information obtained for the purposes of this study

is either classified, restricted material or considered to be confidential to RPS. Therefore, summaries of such information have been provided.

It must be emphasised that this desk study is only able to identify the potential for UXO to be present. Further geophysical surveys and target investigation may be necessary to provide confirmation of the presence of UXO and the actual risks involved.

Note: Our appraisal relies on the accuracy of the information contained within the documents consulted which have been deemed suitable following review. RPS will however in no circumstances be held responsible for the accuracy of such information or data supplied.

1.6 Sources of Information

The main sources of information consulted by RPS for this report were obtained from within the public domain. Additional sources reviewed are below:

- RPS Archives;
- Military Archives;
- National Archives;
- Historic Maps, Aerial Photographs and Records; and
- Internet Research.

RPS has also consulted a series of research documents to compile this report. These are listed in **Section 1.6.1** below.

1.6.1 Specific Documents

RPS has consulted a number of research documents and existing reports in researching this report. These are listed below:

- [1] Menzel, P., Wranik, H. & Paschen, M. (2017). Laboratory experiments and numerical simulations on the wave and flow-induced migration of munition from WW1 and WW2 as a risk assessment for offshore construction. Lehrstuhl für Meerestechnik.
- [2] ConocoPhillips. (2022). Otway Exploration Drilling Program Environment Plan. Section 2: Description of Activity. Rev 00b

1.7 Additional Deliverables

In addition to this report, RPS will supply the client with GIS deliverables representing UXO Features and Risk Zones. These will be supplied in Layer Package format.

Note: Due to licencing agreements with the data provider, RPS are not able to supply wreck data in spatial format. As such, relevant wreck data is tabulated in Section 3.4 and shown visually in Appendix 5.

2 SITE DETAILS AND DESCRIPTION

2.1 Area of Interest

The Area of Interest (AOI) is the **Otway Exploration Drilling** Permit Areas VIC/P79 and T/49P. These permit areas are located in the Otway Basin, between Warrnambool, Victoria and King Island. Permit Area VIC/P79 covers an area of approximately 2576 km², whilst Permit Area T/49P covers an area of approximately 4690 km².

A site location map has been presented at **Appendix 1**.

2.2 Proposed Scheme of Work

The client has indicated that the following activities are to take place within the AOI:

- Well Drilling (up to 6 locations);
- MODU Anchoring;
- Peel Grab Operations;
- Borehole/Vibrocore;
- CPT; and
- Grab Sampling.

The client has indicated that up to 12 geotechnical investigation locations will be utilised per potential drilling location, with sampling equipment deployed over the side the vessel and placed on the seabed. The indicative total footprint is 0.072 m² per potential drilling location.

2.3 Background Geology

The site is located within the Otway Basin, a large approximately 500 km long NW-SE basin located to the south of Warrnambool and north-west of Tasmania. The Otway Basin is Jurassic – Late Cretaceous in age and is part of a series of basins that follow the southern coast of Australia. The basin was formed through multi-stage rift-sag and inversion phases. The latest sediments deposited in the Jurassic - Early Cretaceous can reach up to 8 km thick in parts of the basin.

3 UNEXPLODED ORDNANCE RISK ANALYSIS

3.1 Naval Warfare

Due to its distance from the major theatres of war in the 20th century, the waters off the southern coast of Australia have been spared much of the UXO contamination from fighting evident in other parts of the world. Nevertheless, low level naval activity did take place in the wider Area of Interest (AOI), and the following sections summarise the known activities that may have resulted in UXO presence within and close to the AOI.

3.1.1 World War One (WWI) (1914-1918)

There is no evidence to suggest any significant military activity took place within or around the AOIs during this conflict that may have resulted in the presence of UXO. Away from the European and Mediterranean theatres, the Australian Navy operated largely to the north of Australia, in the Indian Ocean and around the Netherlands East Indies (Indonesia) with a minimal presence in the wider area of the AOI.

3.1.2 World War Two (WWII) (1939-1945)

Disguised German raiding vessels operated briefly in waters off the south Australian coast in 1940, laying a number of mines (see **Section 3.3.2**). Following Japan's entry into the war in December 1941, Japanese submarines operated off the southeast coast of Australia, with some attacks recorded on Sydney and on shipping at the eastern edge of the Bass Strait. For example, Japanese submarine *I-27* sank the merchantman *Iron Crown* approximately 40 miles south/southwest of Gabo Island, Victoria on 03 June 1942¹. No information has been found, however, to suggest that Japanese submarines operated within the AOI.

Japanese submarine *I-25* circumnavigated Tasmania in February 1942 and loitered off the northern tip of King Island for several days before launching a reconnaissance aircraft on a flight over the Melbourne area. No combat occurred and although the submarine likely transited a portion of both AOI's no UXO risk is known to exist as a result².

German surface raiders operated intermittently off Australia in 1942 and 1943 but none are reported to have operated in the vicinity of the AOI.

3.2 Mine Laying Campaigns

3.2.1 World War One (WWI) (1914-1918)

The German raiding vessel *Wolf* laid mines off New Zealand in June 1917, before moving into Australian waters and laying a small minefield of 25 mines approximately 10 km off Gabo lighthouse, Victoria, on 3rd July 1917³, claiming several vessels as victims. There is no information available, however, to indicate that mines were laid in other areas and given that Gabo is almost 600 km east of the AOIs, the UXO risk from mines of this period is considered to be extremely limited.

3.2.2 World War II (WWII) (1939-1945)

Two German surface raiders are known to have laid mines in the wider AOI in 1940. The vessel *Pinguin* entered the Indian Ocean from the South Atlantic in August 1940 and arrived off Western Australia in October. On 7 October *Pinguin* captured the Norwegian tanker *Storstad* which was sailing from Borneo to Melbourne. A German prize crew took over *Storstad* (re-named as *Passat*) and mines were transferred to her from *Pinguin*. The two ships then sailed to the east. *Pinguin* laid EMC (*Elektrische Minen* Type C moored contact mines) mines off the New South Wales coast between Sydney and Newcastle on the night of 28th

¹ Hiromi, T, 2022, *The Japanese Navy's operations against Australia in the Second World War; a commentary on Japanese sources*. Australian War Memorial

² <https://www.ozatwar.com/japrecce/recce02.htm>

³ Journal of the Australian Naval Institute, May 1987, *The Seamine as a 'First Strike' weapon against Australia – Then and Now*. Vol. 13, No.2, p25

October, with both vessels then departing for Tasmanian waters. *Pinguin* laid two minefields off Hobart on 31st October and 1st November, and over the period 29–31 October *Storstad* laid mines in Banks Strait off the north-east corner of Tasmania and off Wilson's Promontory and Cape Otway on the Victorian coast. *Pinguin* also laid further mines in Spencer Gulf off Adelaide in South Australia in the first week of November. The two ships then sailed west for the Indian Ocean, having avoided all detection. Mines laid by *Passat* sank the cargo ship *Cambridge* off Wilsons Promontory and the American *City of Rayville* off Cape Otway on 8 and 9 November, and the mines laid off Sydney by *Pinguin* sank the coastal steamer *Nimbin*. The British steamer *Hertford* was also damaged after striking a mine at the entrance to Spencer Gulf.

Information relating to the mines laid by *Pinguin* and *Passat* are held by German archives that have been reviewed by RPS. The closest mine lines to the AOI are recorded as being 24 km east of the VIC/P79 AOI and 22.8 km north of T/49P AOI. This distance, combined with the limited number of mines laid, indicates that the potential for the presence of German EMC mines within both AOI is very low but cannot be completely excluded.

There is no information that suggests Japanese or allied mines were deployed operationally in either of the AOIs.

Minesweeping operations began in early January 1941, after the sinking of the *Cambridge*. The Australian 20th Minesweeping Flotilla searched the waters around Tasmania and the Bass Strait regularly for 14 months after the initial minelaying operation. The number of mines swept is inconsistent, with one source stating that 19 German mines⁴, were recovered, and another that 20 were found⁵; either way, even when taking successful detonations and reports of mines swept ashore into account, a very low number of mines are likely to have been dealt with compared to the 230 EMC mines reportedly laid⁶. Statistics for north European waters, which experienced a much higher density of mining and much more intense minesweeping, indicate that 25% of moored contact mines laid remain un-swept and potentially present today⁷.

The majority of the mines laid by the Germans in the Bass Strait area were reported to have become 'floaters' within four months of deployment⁸ *i.e.* they broke away from their mooring mechanisms and floated with the currents, which greatly complicated sweeping operations. The Australian Navy believed they unknowingly cut and swept the last mine off Cape Otway on 22 July 1942⁹ but there is no proof that all mines were accounted for, and there is a possibility, albeit remote, that unexploded German EMC mines may have drifted into the AOIs.

⁴ <https://www.navy.gov.au/hmas-orara>

⁵ Journal of the Australian Naval Institute, May 1987, *The Seamine as a 'First Strike' weapon against Australia – Then and Now*. Vol. 13, No.2, p29

⁶ German Bundesarchiv, ZA/5/44/22 *Summary of Enemy minelaying 1939-1945*

⁷ Swedish Navy Mine Warfare Centre, Lt Cdr G Moller *pers. Con.*

⁸ Journal of the Australian Naval Institute, May 1987, *The Seamine as a 'First Strike' weapon against Australia – Then and Now*. Vol. 13, No.2, p28

⁹ *Ibid.* p29

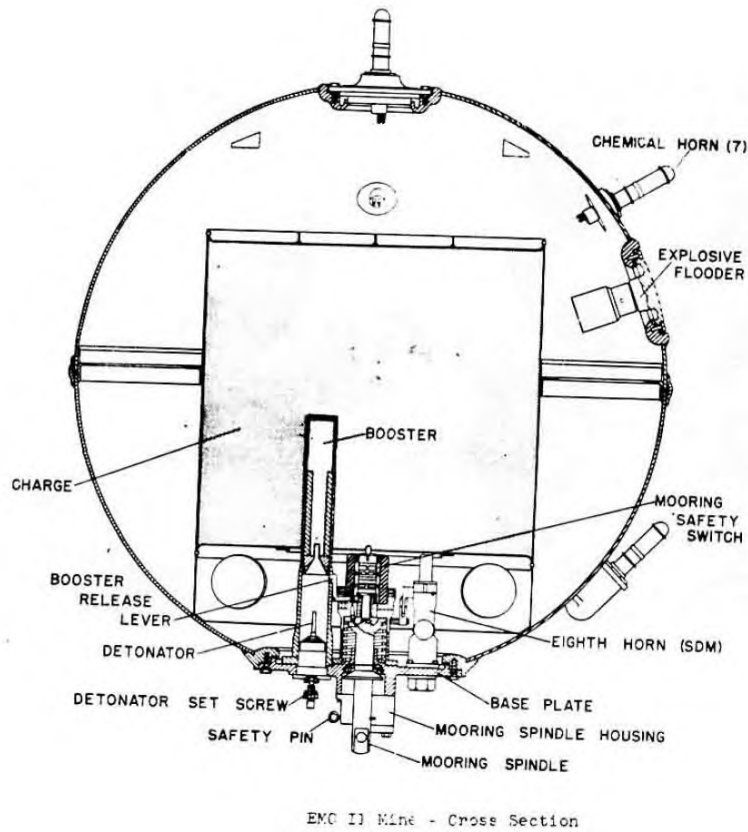


Figure 3.1 - Diagram showing a cross section of a German EMC mine of the type laid off the south coast of Australia in 1940. US Navy OP 1673A



Figure 3.2. German EMC mine swept off Wilson's Promontory, Victoria, approximately 240 km east of the AOIs. One of two swept, both were sunk by rifle fire and considered destroyed (Public Domain)¹⁰

¹⁰ <https://www.awm.gov.au/collection/C1027269>

3.3 Aerial Conflict and Bombing Campaigns

3.3.1 World War One (WWI) (1914-1918)

No information is available to suggest that aircraft operated within the AOI or would have created a UXO risk.

3.3.2 World War Two (WWII) (1939-1945)

There is no evidence to suggest that aerial conflict occurred within the AOI during this period. However, Australian aircraft (Hudson and Anson types being the main maritime patrol aircraft) routinely flew off the south coast of Australia and over the Bass Strait as part of anti-submarine patrolling and convoy escort. No enemy vessels are certainly known to have been attacked, and none are known to have been destroyed, aircraft did occasionally jettison ordnance when in difficulty or even disappeared over the ocean as a result of poor flying conditions or mechanical failure; aircraft lost in this way are considered to be the most likely source of UXO as a result of air operations from WWII (see Section 3.4.2).

3.4 Shipwrecks and Downed Aircraft

No information has been found to indicate the presence of a shipwreck or downed aircraft within either AOI. A single wreck, the *W Gordon*, a sailing vessel that disappeared off Cape Otway in 1876 (i.d. 6784), is charted within the buffer of the T/49P AOI but has no known UXO association. Even the site of the wreck is speculative as only fragments of the vessel washed ashore at Cape Otway.

It is possible that vessels and aircraft that disappeared without trace might be located within the AOIs; whilst any UXO potential is likely to be limited, all previously unknown wrecks should be treated with caution until proved safe.

3.5 Anti-Aircraft Artillery / Coastal Batteries

3.5.1 World War One (WWI) (1914-1918)

There is no information that suggests a UXO risk exists from any land-based artillery system of the period.

3.5.2 World War Two (WWII) (1939-1945)

There is no information that suggests a UXO risk exists from any land-based artillery system of the period.

Naval vessels were routinely equipped with dedicated anti-aircraft guns from the late 1920s onward but the probability of projectiles that might represent a UXO risk being present in the AOI is considered negligible.

3.6 Military Practice Areas

A rectangular area west of King Island, Tasmania, was used in 1954 as an Air-to-Air firing range. The UXO risk from primary Air-to-Air Weapons systems in use at the time (20 mm and 30 mm cannon) is unlikely to impact sub-surface operations but individual projectiles might represent a hazard if brought aboard a vessel. The area does not appear to have been used since 1954.

No other military Practice and Exercise Areas (PEXA) are located in the vicinity of the AOI.

3.7 Offshore UXO Dumpsites

Three official maritime munitions dumping areas are recorded between 21 km and 50 km west of the T/49P AOI, these same areas being located between 37 km and 62 km south of the VIC/P79 AOI. One of these dumping areas was used for the disposal of 1,634 tons of chemical munitions but all three sites are located beyond the edge of the continental shelf, in deeper water and have no direct impact on either AOI.

Despite the designation of official dumping areas, there is good evidence to indicate that munitions dumping took place away from these sites (a very common occurrence by all nations in the post WWII period); the War Diary of HMAS *Tarakan* (also known as *LST 3017*) indicates it dumped 650 tons of obsolete ammunition for the RAAF (speculatively aircraft bombs) on 09 July 1949 and 11 July 1949. Two separate dumping areas appear to have been used, firstly one located at an unspecified location west of King Island. Poor weather

interrupted operations and after dumping all the ammunition stored on the upper deck, the vessel went to a sheltered anchorage in Elephant Bay (now called Elephant Seal Bay) on the east of King Island. Whilst there, the remaining 250 tons of ammunition stored in the tank hold was brought to the deck, and then the ship travelled to an apparently separate dumping area south west of King Island for dumping to be completed on 11 July 1949¹¹. As no co-ordinates were given for the dumping area, the actual location is unclear.

Dumping was often very poorly recorded. For example, HMAS *Tarakan* dumped 350 tons of ammunition loaded at Bell Bay Tasmania whilst enroute to Hobart on 30 April 1948; there is no record of the ammunition (obsolete 18-lbr and 4.5-inch howitzer projectiles) being dumped in a specifically designated area and a trail of projectiles is likely to litter the seabed along part of the course the vessel took. A further 445 tons of ammunition was dumped enroute from Bell Bay to Hobart on 21/22 May 1948; the original plan for dumping obsolete Tasmanian ammunition called for it to be dumped in 300 fathoms (548 m) approximately 80 km from the coast¹².

Whilst not near either AOI, the HMAS *Tarakan* dumping episodes are illustrative of the unofficial dumping that frequently took place and may well have been carried out by vessels traversing the AOIs. It is therefore possible that unrecorded dumping took place following the end of WWII and that UXO might be found within the AOIs.

A possible civilian dumpsite (the materials may be related to mining rather than military use) has been identified approximately 3.79 km southwest of the VIC/P79 AOI. The following table summarises the materials known to have been dumped at that site and is included for completeness.

Table 3.1 - Summary of known materials dumped within 3.79 km of VIC/P79¹³

Date	Item	Quantity	Notes
23/07/1970	Cyanide	90 gallons	18 x 5 gallon drums
23/07/1970	Cyanide	96 gallons	4 x 24 gallon drums
23/07/1970	Explosives	144 boxes	No further information – type unspecified
23/07/1970	Detonators	2331 cases	No further information – type unspecified
23/07/1970	Cordtex	168 cases	55lb in each case, explosive detonating cord containing PETN explosive (9,240 lb total). PETN is insoluble in water and may be encased in plastic coating so may still represent a risk.

3.8 OSPAR Munition Encounters

The AOI is outside the Oslo and Paris Agreement reporting area and no data is therefore available.

3.9 Post-War Clearance Operations

The Australian 20th Minesweeping Flotilla may have conducted post-WWII sweeping operations in Newcastle, Bass Strait, Banks Strait, Cape Otway, Hobart and South Australia minefields after the end of the war¹⁴. No information has been found to indicate they were any more successful than during WWII and no information has been found on the number

3.10 Current and Emerging Threats

The Bass Strait is located well away from current centres of global tension and as a result is likely to be less impacted by the development and use of new maritime technology such as drones and submarines and covert efforts to interfere with sub-surface marine infrastructure. Although not considered a significant risk, it should be borne in mind.

¹¹ AWM78 Class 337/2 – HMAS *Tarakan* Report of Proceedings May-December 1949

¹² National Archives of Australia P617, 406/1/206

¹³ Government of Australia, 2003, *Sea Dumping in Australia: Historical and Contemporary Aspects*

¹⁴ Australian War Memorial 124/4/394 *Minesweeping operations by 20th Minesweeping Flotilla in Newcastle, Bass Strait, Banks Strait, Cape Otway, Hobart and South Australia minefields*

4 BASELINE THREAT ASSESSMENT

The results of the historical review have been used to conduct a threat assessment to determine the baseline pre-exploration and pre-mitigation risk posed by UXO contamination on site. The assessment outlines the types of UXO that have been identified during the research and assesses the probability of encountering them on site (without considering that any construction activities have already taken place).

4.1 Probability Assessment

Each of the types of UXO that have been identified through the research have been assessed and given a probability of encounter Grade based on the following Level and Rationale.

Table 4.1 - Probability Levels

Probability Assessment Levels		
Grade	Probability Level	Rationale
A	Highly Probable	Clear evidence that this type of munition would be encountered.
B	Probable	Significant evidence to indicate that this type of munition would be encountered.
C	Possible	Evidence suggests that this type of munition could be encountered.
D	Remote	Evidence suggest that these munitions have been found in the Wider Area of Interest area but not specifically within the AOI.
E	Improbable	Not considered likely to encounter this type of munition within the AOI, but not possible to discount completely.
F	Highly Improbable	No evidence that this type of munition would be encountered within the AOI or the immediate vicinity.

4.1.1 Risk Zoning

The probability assessment results will vary across the site due to the geographical extent of the potential UXO sources identified in the research presented above. This results in a different risk profile across the site based upon these affected areas. RPS divide the site into Risk Zones based upon the probability assessment results (in addition to planned activities and water depths) in order to ensure that a pragmatic approach is taken to the risk of each ordnance type across the site. The results of the probability assessment are shown in **Table 4.2**. RPS Risk Zoning is shown graphically at **Appendix 8**. The sources of UXO which influence the risk zoning and probability assessment are shown graphically in **Appendix 4** and detailed in **Section 6.1.2**.

4.1.2 Probability Assessment Results

The research from the above sections has been used to determine the Probability of Encounter for each ordnance variety. The results are shown in the table below:

Table 4.2 - Shows the probability of encounter for each assessed ordnance variety, based on the research provided in the prior sections

Probability of Encounter					
UXO		Risk Zones			
		A	B	C	D
Small Arms Ammunition		E	E	E	E
Land Service Ammunition		E	E	E	E
≤155 mm Projectiles		E	D	D	E
>155 mm Projectiles		E	E	E	E
HE Bombs	Allied Origin	E	D	D	E
	Axis Origin	F	F	F	F
Allied Origin (Contact Mine)		E	E	E	E

Probability of Encounter					
UXO		Risk Zones			
		A	B	C	D
Sea Mines	Allied Origin (Ground Mine)	E	E	E	E
	Axis Origin (Contact Mine)	D	D	D	D
	Axis Origin (Ground Mine)	E	E	E	E
Torpedoes		E	E	E	E
Depth Charges		D	D	D	D
Conventional Dumped Munitions		C	C	C	C
Dumped Chemical Munitions		D	D	D	D
Missiles/Rockets		E	E	E	E

Due to the extremely limited interaction with the seabed the proposed scheme of works will have (with a limited number of wellsite areas across both permit areas) and indicative total footprint of geotechnical activities at each location is 0.072 m², RPS have revised the probability of encountering each munition at each individual wellsite.

Note: The following Probabilities of Encounter are applicable only at the limited number of wellsite and seabed survey locations. Works further to those being conducted at the limited number of wellsite and seabed survey locations will be subject to the Probabilities of Encounter in Table 4.2 and RPS would have to be informed prior to additional works being undertaken.

Table 4.3 - Probability of Encountering each munition type whilst undertaking the described works. Due to the limited interaction with the seabed the proposed activities will have, the Probability of Encounter is reduced in comparison to the Permit Area as a whole

Probability of Encounter					
UXO		Risk Zones			
		A	B	C	D
Small Arms Ammunition		F	F	F	F
Land Service Ammunition		F	F	F	F
≤155 mm Projectiles		F	E	E	F
>155 mm Projectiles		F	F	F	F
HE Bombs	Allied Origin	F	E	E	F
	Axis Origin	F	F	F	F
Sea Mines	Allied Origin (Contact Mine)	F	F	F	F
	Allied Origin (Ground Mine)	F	F	F	F
	Axis Origin (Contact Mine)	E	E	E	E
	Axis Origin (Ground Mine)	F	F	F	F
Torpedoes		F	F	F	F
Depth Charges		E	E	E	E
Conventional Dumped Munitions		D	D	D	D
Dumped Chemical Munitions		E	E	E	E
Missiles/Rockets		F	F	F	F

5 RPS UXO ANALYSIS & ASSESSMENT

5.1 General

A Risk Assessment is a formalised process for assessing the level of risk associated with a particular situation or action. It involves identifying the hazards and the potential receptor that could be affected by the hazard. The degree of risk is associated with the potential for a pathway to be present, linking the hazard to the receptor. This relationship is usually summarised as the Source – Pathway – Receptor.

The assessment has utilised information provided in **Section 3** and included the proposed intrusive activities to propose a more specific and detailed mitigation methodology.

5.2 Sources / Hazards

Based on the information collated, RPS considers that the following types of ordnance have the potential to have been utilised on/within the vicinity of the proposed site:

- Projectiles
- Allied HE Bombs
- Depth Charges
- Conventional Dropped Munitions
- Dropped Chemical Munitions

Importantly, whilst the technology in some of these munitions has altered significantly over the years, the composition of the explosives within them generally has not changed. It is the explosives within the devices that pose the risk; therefore, historic munitions can pose as significant of a risk today as more modern devices, especially as bulk explosives may not have degraded since the time the device was assembled.

It should be considered that WWI and WWII munitions will be found on or below the sea floor that are still hermetically sealed; with no water ingress. Other devices may however be cracked, with the outer casings of some mines for example, worn away over time. Therefore, it is not possible to state with any certainty that historic munitions pose less of a risk based on their degradation over time.

5.3 Pathway

The pathway is described as the route by which the hazard reaches the site personnel. Given the nature of the proposed works the only pathways would be during:

- Well Drilling;
- Snag on Vessel;
- Anchoring;
- Peel Grab Operations;
- Borehole/Vibrocore;
- CPT; and
- Grab Sampling.

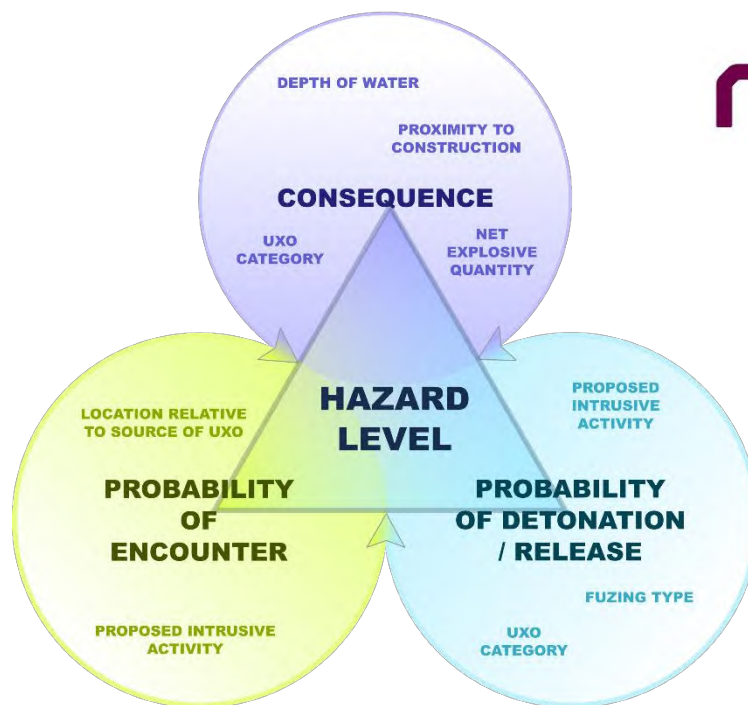
5.4 Receptors

Sensitive receptors applicable to this proposed route would be:

- People (Workers / Engineers and General Public);
- High Value Equipment;
- Infrastructure;
- Vessels (including public); and
- Environment.

5.5 Risk Evaluation

The following sections contain the Risk Evaluation for the proposed route, prior to the implementation of any risk mitigation measures. For the risk to be properly defined, several factors must be taken into account, including the consequences of initiation, the probability of encountering UXO on the proposed route and the probability of detonating munitions during intrusive activities. The technique used to evaluate level of risk is outlined in the following diagram:



$$\text{Risk level} = \text{Probability of Encounter} \times \text{Probability of Detonation or Release} \times \text{Consequence}$$

Figure 5.1 - Hazard Level Considerations

If a significant risk is identified, an appropriate risk mitigation strategy is necessary for the intended geotechnical investigation and installation works. A semi quantitative assessment is completed below to identify the risk.

5.6 Probability and Consequence Assessment

For the purpose, of this assessment RPS has examined the probability of encounter and detonation and the potential subsequent consequence for the specific proposed works to be undertaken during the project. Only the main categories of munitions have been included to provide a range of assessment data and it should be noted that other munition types may remain in the area.

The assessment is presented at **Appendix 6** and the process detailed below.

5.6.1 Probability of Encounter Assessment

An estimate of the likelihood of a UXO risk being present within each route segment is made to assess the probability of encounter, which are ranked A – F, as below.

- A – Highly Probable
- B – Probable
- C – Possible
- D – Remote
- E – Improbable
- F – Highly Improbable

5.6.2 Probability of Detonation Assessment

The probability of encounter is combined with the probability of a certain munition type detonating. The probability of each engineering activity causing each munition type to detonate is assessed and ranked A – F:

- A – Highly Probable
- B – Probable
- C – Possible
- D – Remote
- E – Improbable
- F – Highly Improbable

This is based on the estimated disturbance caused by the installation activity and the likelihood for this to cause a detonation of specific munitions (*which is based on the items initiation systems*).

5.6.3 Consequence Assessment

Finally, the consequence level for each activity and munition type is obtained from the table presented in **Appendix 7**, which provides a consequence rating from 1 to 5, depending upon the severity. The detonation consequence assessment assigns a site-specific consequence level to any potential UXO that may be encountered at the proposed route. This is achieved by combining the UXO impact ranking and the depth of water across the proposed route. A rating system for assigning consequence levels has been derived based on the expected effects of a detonation event during each of the engineering activities, both on the seabed and on the vessel.

5.6.4 Risk level

The result for each activity, munition type and segment are then presented as:

$P_E \times P_D \times C$; where:

- P_E is the Probability of Encounter level, (A – F)
- P_D is the Probability of a Detonation level (A – F)
- C is the Consequence of a Detonation level (1 – 5)

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The probability of encounter, probability of detonation/release and consequence of a detonation/release levels are then multiplied to give a risk level for each munition type, segment and engineering activity.

This was determined by assigning the values in the following table to the above results, which were then multiplied to provide a final risk level ranging between Negligible and High.

Table 5.1 - Probability & Consequence Levels

Prob. of Encounter (1)		Prob. of Detonation (2)		Consequence (3)	
A	Highly Probable (1 in 1)	A	Highly Probable (1 in 1)	1	Catastrophic (1.00)
B	Probable (1 in 10)	B	Probable (1 in 10)	2	Major (0.1)
C	Possible (1 in 100)	C	Possible (1 in 100)	3	Moderate (0.01)
D	Remote (1 in 1,000)	D	Remote (1 in 1,000)	4	Minor (0.001)
E	Improbable (1 in 10,000)	E	Improbable (1 in 10,000)	5	Insignificant (0.0001)
F	Highly Improbable (1 in 100,000)	F	Highly Improbable (1 in 100,000)		

Table 5.2 - Example Risk Score and Associated Risk Rating (Full details in Appendix 7)

C = 1		Probability of Encounter, P _E					
		A	B	C	D	E	F
Probability of Detonation, P _D	A	AA1	BA1	CA1	DA1	EA1	FA1
	B	AB1	BB1	CB1	DB1	EB1	FB1
	C	AC1	BC1	CC1	DC1	EC1	FC1
	D	AD1	BD1	CD1	DD1	ED1	FD1
	E	AE1	BE1	CE1	DE1	EE1	FE1
	F	AF1	BF1	CF1	DF1	EF1	FF1

Table 5.3 - Definition of Risk Levels

Risk Level	Definition
High	Indisputable evidence that there is a risk from this type of UXO in the area. Proactive UXO Mitigation is required.
Moderate	Evidence suggests that there is a risk from this type of UXO in the area. Proactive UXO Mitigation is required.
Low	Some evidence suggests that there is a risk from this type of UXO in the area or wider region. Reactive mitigation may be required.
Negligible	No evidence suggesting that there is a risk from this type of UXO in the area or wider region. No further mitigation is required.

The full consequence level matrix can be found in **Appendix 7**.

6 UXO RISK LEVELS

6.1 UXO Risk

Note: The Risk Levels identified in this study are based upon Probabilities of Encounter which have been determined for the provided Scope of Works (i.e. a limited number of wellsite drilling and seabed survey locations) which, due to the limited nature of interaction with the seabed are lower overall than those for the entirety of the Permit Areas. If the client were to conduct extensive further works, RPS must be consulted so that the risk posed by the additional interaction with the seabed can be assessed.

Based on the conclusions of the research and the risk assessment undertaken, RPS has found there to be a **Low** risk from encountering UXO on site.

As per **Figure 5.1** RPS also take in to account the category of UXO both when assessing the probability of the item functioning and the consequence of such an event. This leads to the varying risk levels between munitions with the same installation methodology. The full risk matrices are presented in **Appendix 6**, providing an assessment of the risk associated with each activity.

The Permit Areas have been split into 4 zones (A-D), dependent on the risk presented and the planned installation activities. **Table 6.1** shows the maximum risk for each zone. Descriptions of the zones are given in **Section 6.1.2**. RPS Risk Zoning is shown graphically in **Appendix 8**.

6.1.1 Risk Levels

Table 6.1 - Overall Risk Level

Overall Risk Levels					
UXO		Risk Zones			
		A	B	C	D
Small Arms Ammunition		Neg	Neg	Neg	Neg
Land Service Ammunition		Neg	Neg	Neg	Neg
≤155 mm Projectiles		Neg	Neg	Neg	Neg
>155 mm Projectiles		Neg	Low	Low	Neg
HE Bombs	Allied Origin	Low	Low	Low	Low
	Axis Origin	Neg	Neg	Neg	Neg
Sea Mines	Allied Origin (Contact Mine)	Low	Low	Low	Low
	Allied Origin (Ground Mine)	Low	Low	Low	Low
	Axis Origin (Contact Mine)	Low	Low	Low	Low
	Axis Origin (Ground Mine)	Low	Low	Low	Low
Torpedoes		Low	Low	Low	Low
Depth Charges		Low	Low	Low	Low
Conventional Dumped Munitions		Low	Low	Low	Low
Dumped Chemical Munitions		Low	Low	Low	Low
Missiles/Rockets		Low	Low	Low	Low

6.1.2 Risk Zones

6.1.2.1 Zone A – Low Risk

Permit Area VIC/P79 outside King Island air-to-air firing area

This zone represents the area of the VIC/P79 Permit Area which lies outside the King Island air-to-air firing area. In this zone there is the potential to encounter dumped conventional and chemical munitions. There are a number of dumpsites in the vicinity of this zone, including conventional munitions dumpsites, chemical munitions dumpsites and an assumed mining waste dumpsite (which includes explosives, in the form of detonators, PETN Detonating Cord and bulk explosives and chemicals including cyanide). Although this zone

lies outside of the known dumpsites, it is expected that munitions may have been disposed of *en route* from ports to official dumpsites, and so it is anticipated that they could be encountered in this area.

6.1.2.2 Zone B – Low Risk

Permit Area VIC/P79 inside King Island air-to-air firing area

This zone represents the area of the VIC/P79 Permit Area which lies inside the King Island air-to-air firing area. In this zone there is the potential to encounter small calibre (20 mm and 30 mm) projectiles associated with air-to-air gunnery practice. Further to this, there is the potential to encounter dumped conventional and chemical munitions. There are a number of dumpsites in the vicinity of this zone, including conventional munitions dumpsites, chemical munitions dumpsites and an assumed mining waste dumpsite (which includes explosives, in the form of detonators, PETN Detonating Cord and bulk explosives and chemicals including cyanide). Although this zone lies outside of the known dumpsites, it is expected that munitions may have been disposed of *en route* from ports to official dumpsites, and so it is anticipated that they could be encountered in this area.

6.1.2.3 Zone C – Low Risk

Permit Area T/49P inside King Island air-to-air firing area

This zone represents the area of the T/49P Permit Area which lies inside the King Island air-to-air firing area. In this zone there is the potential to encounter small calibre (20 mm and 30 mm) projectiles associated with air-to-air gunnery practice. Further to this, there is the potential to encounter dumped conventional and chemical munitions. There are a number of dumpsites in the vicinity of this zone, including conventional munitions dumpsites and chemical munitions dumpsites. Although this zone lies outside of the known dumpsites, it is expected that munitions may have been disposed of *en route* from ports to official dumpsites, and so it is anticipated that they could be encountered in this area.

6.1.2.4 Zone D – Low Risk

Permit Area T/49P outside King Island air-to-air firing area

This zone represents the area of the T/49P Permit Area which lies outside the King Island air-to-air firing area. In this zone there is the potential to encounter dumped conventional and chemical munitions. There are a number of dumpsites in the vicinity of this zone, including conventional munitions dumpsites and chemical munitions dumpsites. Although this zone lies outside of the known dumpsites, it is expected that munitions may have been disposed of *en route* from ports to official dumpsites, and so it is anticipated that they could be encountered in this area.

6.1.3 Risk Level by Activity

The risk level in each zone varies depending on the exploration activities being undertaken as well as the types of ordnance expected in each zone. As outlined in **Section 5.6**, the risk level for each ordnance type and each activity is determined using the Probability of Encounter, Probability of Detonation and Consequence of Detonation.

The Probability of Detonation varies between exploration activities as each activity interacts with the seabed in a different way, either increasing/reducing the chance of the equipment/asset interacting with potential UXO or increasing/decreasing the amount of energy transferred from the equipment/asset to potential UXO, which may result in a detonation. For example, a plough (as it is intrusive and higher energy) has an increased Probability of Detonation compared to a non-intrusive activity, such as Surface Cable Lay. The second factor which changes between activities is the Consequence of Detonation. This is because the potential consequences of striking UXO with a plough on the seabed towed behind the boat is significantly lower than if UXO were snagged on equipment and brought to deck (Snag on Vessel).

The Risk Level of each activity within each Risk Zone are shown in **Table 6.2**.

Table 6.2 - Risk Level by Activity and Risk Zone

Risk Level by Activity				
Activity / Pathway	Risk Zone			
	A	B	C	D
Well Drilling	Low	Low	Low	Low
Snag on Vessel	Mod	Mod	Mod	Mod
Anchoring	Low	Low	Low	Low
Peel Grab Operations	Low	Low	Low	Low
Borehole / Vibrocore	Low	Low	Low	Low
CPT	Low	Low	Low	Low
Grab Sampling	Low	Low	Low	Low

7 DATA REVIEW

RPS has not been supplied with site-specific bathymetric or seabed sediment data; open-source bathymetric and seabed sediment data has been reviewed to provide an overview of the expected water depths, seabed features and seabed sediments on site.

7.1 Bathymetry

Open-source bathymetric data has been used to provide an overview of the expected water depths across the two permit areas.

The water depths across the VIC/P79 Permit Area range from 35 m in the northwest of the permit area to over 1100 m in the south of the permit area. For the most part, the area sits on the continental shelf, lying in water depths <120 m. As the site extends southwest from the 120 m w.d. contour, the seabed descends more rapidly to >1100 m w.d.

The water depths across the T/49P Permit Area range from 70 m in the east of the permit area to 1465 m in the southwest of the permit area. For the most part, the area sits on the continental shelf, lying in water depths <120 m. As the site extends west from the 120 m w.d. contour, the seabed descends more rapidly to >1400 m.

7.2 Seabed Sediments

It is anticipated that the seabed sediments in the Permit Areas will be composed of lithoclastic sands and gravels in areas lying on the continental shelf, with fine sands, carbonate rich muds and muddy sands in areas lying on the continental slope.

7.2.1 Mobile Sediment Bedforms

It is known that mobile sediment bedforms (ripples, megaripples and sand waves) form in the Bass Strait, with wave heights up to 12 m. It is assumed that in areas of the site where sands are present, there is the potential for sand waves to form.

8 MARINE UXO MIGRATION / DRIFT AND BURIAL

8.1 Migration / Drift

Numerous studies have documented that munitions can migrate across the seafloor; the main force behind this movement is tidal currents. Research by Wilson et al. (2008) highlights that the migration of munitions decreased with burial depth, with munitions in a minimal burial state being particularly susceptible to movement when influenced by a large wave or strong current. Importantly, Wilson's report states that once a munition is completely buried, no further migration occurs unless bottom profile variation allows for re-exposure or there is scour.

The greater the tidal current or current velocity, the greater the likelihood and rate at which UXO items can migrate. However, larger items of UXO such as mines, torpedoes and larger categories of bombs, are unlikely to migrate as far and frequently as smaller items, as they require significant tidal / current velocities to exceed the minimum energy for them to move. Smaller items of UXO, such as AAA projectiles and Small Arms Ammunition (SAA), are more likely to migrate when subjected to lower levels of energy generated by more benign tides and currents.

Additionally, munitions tend to gather in seabed hollows (they roll in, but tidal action is sometimes insufficient to roll them out again). Shoals of fish tend to congregate in seabed hollows too (as they avoid strong currents in slack water) and fishing trawlers trying to catch them are occasionally prone to snagging UXO in their nets bringing them to the surface. Interaction with the seabed from fishing activities are therefore a possible vector for UXO migration.

RPS has considered a report compiled by Menzel, Wrantik and Paschen entitled "*Laboratory experiments and numerical simulations on the wave- and flow-induced migration of munition from WW1 and WW2 as a risk assessment for offshore construction*". This report considers the critical velocities needed to move certain objects at various points of burial. The items considered were:

- British Depth Bomb Mark 1;
- British 250 lb General Purpose Bomb;
- German Mine Type GU; and
- German Mine Type GY.

The critical velocities in m/s are presented below for the various statuses of burial:

Table 8.1 - Critical Velocities

Item	Critical Velocity @ 5% Burial (m/s)	Critical Velocity @ 15% Burial (m/s)	Critical Velocity @ 30% Burial (m/s)	Critical Velocity @ 50% Burial (m/s)
Mark 1	1.2	1.5	1.9	2.2
250 lb GP	1.6	2	2.4	2.7
GU Mine	1.8	2.1	2.5	3.3
GY Mine	2.2	2.7	2.9	3.9

The results show scenarios with conservative assumptions and it should be noted that the following assumptions have been made:

- A sandy, non-cohesive seabed is required;
- The objects must be at least partially buried;
- An accumulation area is formed in the wake of the objects;
- Flow through the sediment is neglected;

- The influence of surface waves is neglected;
- Ripples, dunes and the overall shape of the seabed are constant;
- The influence of the water column above the object is neglected; and
- The value of the incident velocity is defined 20 cm above the seafloor in realistic scale.

The results show that the larger an item is and the greater its mass, the larger the tidal current or current velocity must be to move it.

The most appropriate surrogate for the ordnance expected within the site would be the British Depth Bomb Mark 1, which mobilises at 1.2 m/s when 5% buried. Although no current data has been provided, RPS has reviewed open-source current data which indicates that the current velocity is expected to be a maximum of 1 knot (0.51 m/s), with the current velocities on the seafloor expected to be significantly lower than this. The maximum current velocity on site is lower than the critical velocity noted in **Table 8.1**. Therefore, it is concluded that seabed currents are not sufficient to cause the migration of UXO.

8.2 Depth of Burial

8.2.1 Burial Via Initial Penetration

When a munition is fired/dropped from height, its velocity upon initial impact provides the potential for the item to penetrate the seabed. In situations where a device impacted into >10 m depth of water, it is likely that penetration would have been retarded significantly by the water and the ordnance would come to rest on or very near the seabed (*within the top 2 m*). Given the water depths located throughout the site, it is considered highly unlikely munitions would have become buried when coming to rest on the seabed.

Certain munitions, including those that have either been dumped, placed (*e.g. sea mines*) or have migrated from elsewhere, are likely to have landed on the surface of the seabed rather than penetrating.

8.2.2 Burial Via Natural Processes

In the softer sediments, it is possible for munitions to be covered by shifting sediments on the seabed and subsequently become buried. This is dependent on the mass, dimensions/shape of the item and the sediments upon which it came to rest as well as the currents affecting the area, however the maximum burial depth due to scour is approximately equal to the diameter of the munition. Burial is not possible in areas where bedrock is exposed.

Given the water depths throughout the site, it is considered likely that burial via natural processes (*i.e. mobile seabed*) will be the main form of burial rather than burial as a direct result of penetration upon impact.

8.2.3 Depth of Burial Analysis

RPS have determined that any UXO present on site is likely to be buried to scour depth (approximately equal to the diameter of the munition) plus the wave height of any mobile sediment bedforms present.

9 RISK MITIGATION STRATEGY

9.1 Mitigation Strategy Rationale

RPS’ Risk Assessment for Potential UXO contamination has identified a risk from UXO on site. The research completed established that there is a Moderate UXO Risk within the AOI as the following three components are present:

- **Source:** A UXO risk that exists;
- **Detonation Pathway:** A mechanism that may cause UXO to detonate; and
- **Receptors:** These would be at risk of experiencing an adverse response following the detonation of a munition.

The purpose of risk mitigation is to take action to address one or more of these components to reduce the probability of an incident occurring or to limit the impact of the problem if it does occur; thereby, eliminating the risk or reducing the risk to an acceptable level, or ‘ALARP’.

Obviously, the most effective method of mitigation is to remove the source of the contaminant. However, where this is not feasible it may be necessary to look at alternative methodologies; such as, avoiding a suspect item, removing the detonation pathway or minimising the risks to the receptors.

9.2 Recommendations

Based on the identified risk levels, it is recommended that appropriate mitigation is implemented to reduce the risk, prior to and/or during any works.

Due to the Low-Risk present at the wellsite locations, it would be recommended that Reactive Mitigation is used to manage the residual risk on site. It would be recommended that for all risk areas and activities that at a minimum all personnel are provided an **Explosives Safety and Awareness Briefing**.

The Moderate Risk associated with Snag on Vessel is also mitigated using Reactive Mitigation.

Table 9.1 - Risk Mitigation Strategy Overview

Risk Zone	Activity / Risk Level*	Mitigation Requirement					
		UXO Survey	Avoidance and / or ID&C	Explosives Safety Briefing	Explosives Engineer on Vessel**	Explosives Engineer On-Call	Detection Requirement
A	Low Risk Activities			✓		✓	N/A
B	Low Risk Activities			✓		✓	N/A
C	Low Risk Activities			✓		✓	N/A
D	Low Risk Activities			✓		✓	N/A

* See Table 6.2 for risk level of each activity in each risk zone

** Dependent on Survey Results

For further information about Reactive Mitigation requirements see Section 11

10 ALARP SIGN-OFF

Based on the results of this Desktop Study, ALARP sign-off would be provided for the site, which would demonstrate that appropriate mitigation has been implemented in order to reduce the risks from UXO to exploration activities to an acceptable level i.e. As Low As Reasonably Practicable

Based on the UXO Risk Profile identified for the proposed activities, which has been assessed to be **Low** (barring unknown factors), RPS would give an **ALARP validity of 5 years from issue of the ALARP certification**. RPS would advise that existing data (if available) and the UXO Risk Profile is reviewed during the ALARP period to ensure this validity and to potentially carry it past the 5-year period.

This sign-off would advise residual risk mitigation required. The likely possible requirements are detailed in the following sections.

Table 10.1 - Requirements for ALARP sign-off for the proposed activities

Risk Zone	Activity	Risk Level	Mitigation Requirement	
			ALARP Requirement	Validity
A	Low Risk Activities	Low	Desk Study and Reactive Mitigation	5 Years
B	Low Risk Activities	Low	Desk Study and Reactive Mitigation	5 Years
C	Low Risk Activities	Low	Desk Study and Reactive Mitigation	5 Years
D	Low Risk Activities	Low	Desk Study and Reactive Mitigation	5 Years

N.B. This table does not detail the provisos the ALARP will be under the condition of.

This table provides requirements for ALARP sign-off for the proposed activities. If further/additional activities are to be undertaken, RPS must be consulted

10.1 Data Review

To determine whether it is possible to continue / extend the validity of the ALARP, it would be recommended that a review of the UXO Risk Profile be conducted. This would include review of any additional information which may have come to light since the compilation of this Desktop Study that may have an effect on the UXO Risk Profile. If no additional information was identified that alters the risk, it is likely that RPS would be able to extend the ALARP validity due to the Low Risk nature of the proposed activities.

In addition to the above any changes in industry practices would be reviewed to align the ALARP process in the future. This review can be undertaken at any stage prior to the expiry of the certification (for example at 4.5 years) taking into account notably contingency for additional seasonal restricted surveys in order to allow uninterrupted continuation of projects beyond the expiry date.

11 REACTIVE MITIGATION

The following section outlines in more detail the recommended methods of reactive mitigation that can be implemented on site to further reduce the risks associated with UXO encounters. **Table 9.1** details the zones/activities where reactive mitigation is recommended in place of proactive mitigation.

However, even where a Low Risk has been assessed or after proactive mitigation measures are implemented there will always remain a residual possibility that UXO could be encountered or potentially brought on board the vessels working in the area. Due to the residual risk it is therefore recommended that as a minimum Explosives Safety Awareness be implemented to manage any inadvertent UXO encounters during operations and maintenance.

11.1 Explosives Safety Awareness

Explosives Safety and Awareness Briefings should be provided to personnel carrying out seabed survey and exploration drilling activities. The Briefing would allow the project team to plan the proposed works and potentially deal with the event of a suspicious item / UXO discovery incident. It would address the risk to all of the specific proposed works and will inform personnel how to undertake the works safely and will refer to the specific risk items/hazards that have been identified for the site and where applicable the mitigation that has been completed to reduce the risk.

If deemed beneficial a set of **Explosives Site Safety Guidelines (ESSGs)** could be produced, which would be provided to the Client along with training. The guidelines would allow the project team to manage the safety and awareness briefings and provide them in-house and also allow the project team to manage an inadvertent UXO encounter. The guidelines would typically be provided to the Client in the form of a '*Guidelines Document*' along with a supporting PowerPoint Slideshow. Safety and Awareness Training would be provided to key personnel, offshore teams, survey and trenching teams.

RPS would specifically recommend that these be delivered to personnel involved in intrusive works on the seabed. Training on how to recognise UXO for these personnel would be considered most prudent given the risks in the area.

The Explosive Safety and Awareness Briefing and ESSGs could be built into the induction package for the exploration program.

11.2 Explosives Engineer On-Call for Offshore Activities

RPS would recommend an on-call service is set up which can be used by the contractors in the event of a potential UXO encounter. This would provide 24/7 on-call availability to a UXO Expert who could assist the drilling rig and/or vessel in dealing with a potential UXO encounter. A procedure would be implemented in the event that potential UXO is encountered during exploration activities so that the item can be identified and dealt with as quickly as possible.

11.3 Explosives Engineer on Vessel

If the client requires further assurances, an **Explosives Safety Engineer (Explosives Ordnance Disposal trained)** can be based on board the drilling rig and/or vessel(s) during operations, in order to reduce the risks to personnel and equipment and avoid unnecessary delays and associated costs.

Not all apparent UXO items contain energetic material. A qualified Explosives Safety Engineer can often determine which items are considered UXO and deal with them accordingly. In some cases, it may not be possible to visually determine what the item is due to corrosion or encrustation and therefore whether it is UXO or something benign, such as an oil drum. The EOD Engineer would therefore be able to carry out ordnance recognition and minimise delays due to items that do not turn out to be UXO.

The EOD support would include but not be limited to:

- Attendance at risk assessment meetings, such as HIRA's,
- Carrying out Explosive Ordnance Safety and Awareness Briefings for all personnel. The Briefings would be given to all operational personnel working for the Client on site during cable lay operations,

DESK STUDY FOR POTENTIAL UXO CONTAMINATION

- Development of Emergency Response Plans,
- Monitoring works in order to identify potential UXO items if they are uncovered as works progress,
- Inspecting the equipment (grapnel and trenching equipment) when it is brought back on board the vessel to ensure no ordnance are brought back on board.
- Assist in liaison with relevant authorities / personnel should ordnance be identified and present an explosive hazard,
- Where it is not practical or safe to observe the intrusive works, the Explosives Engineer will be on-call and immediately available to respond to a request for assistance,
- Provide on-call services to immediately respond to suspected ordnance that has been discovered by other site staff,
- Identify an area to which safe-to-move ordnance may be stored prior to recovery by the appropriate authorities.

The main aim would be to avoid interaction with UXO and consider the mitigation that will have already been undertaken in Moderate risk areas and therefore the resulting reduced risk, the risk of encounter should be Low. However, should an item of ordnance be discovered then the following action will be taken:

- a. If an item is identified as ordnance, the Explosives Safety Engineer will carry out an ordnance risk assessment. They will assess the nature of the item, its initiation system as well as determining the explosive content. They will assess the requirement and size of any exclusion zone around the item,
- b. The Explosives Safety Engineer will inform the Client as to the nature of the item and the conclusions of the risk assessment,
- c. If the item does not contain any hazardous components, the Explosives Safety Engineer may remove it from the area of works, or if on the seafloor inform the client that works can continue,
- d. If the item is deemed to pose a risk and cannot be moved, the Explosives Safety Engineer will contact the relevant authorities to dispose of the item.

11.4 Anchor Management

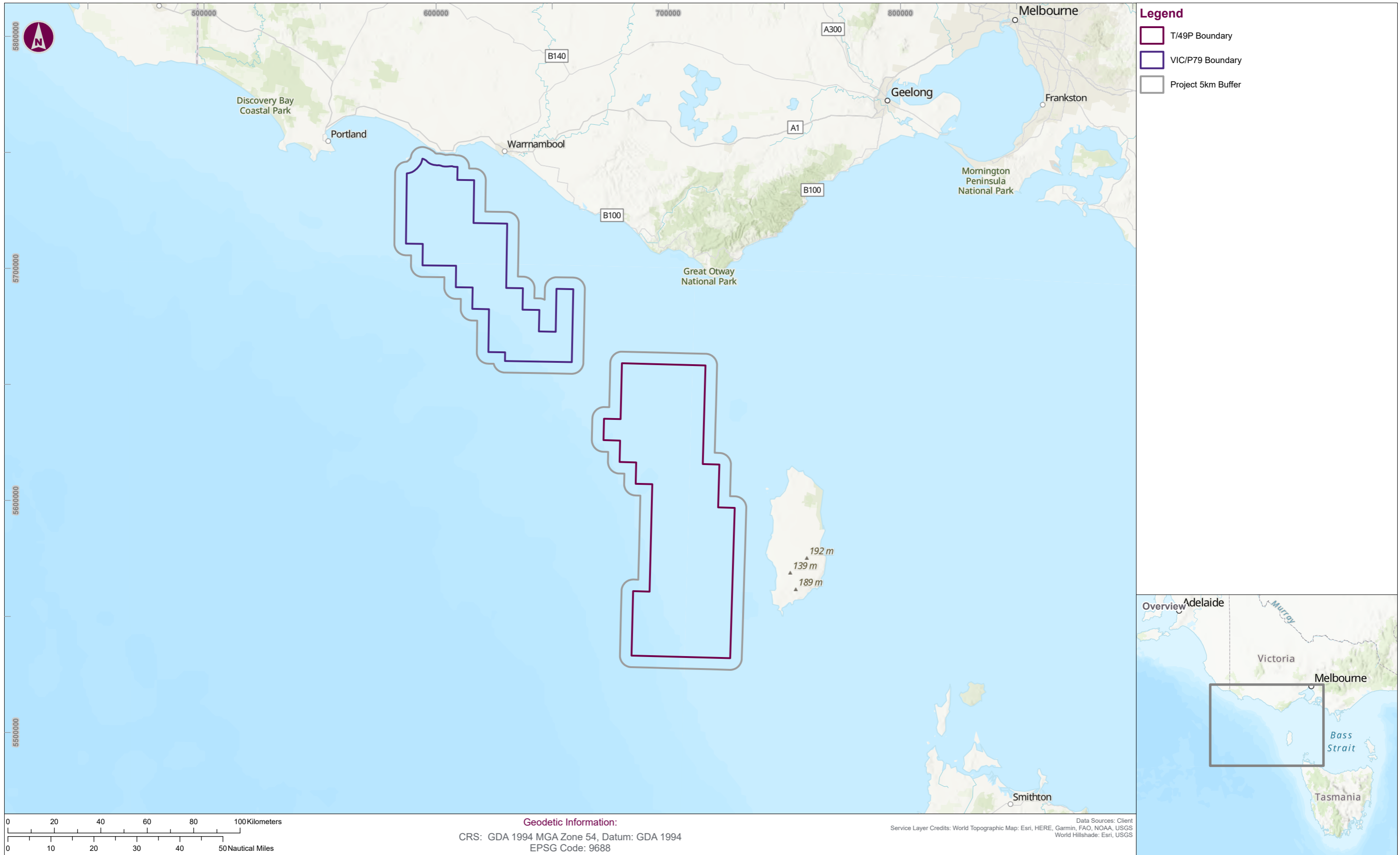
RPS have been advised that seabed survey vessels will not be anchoring. The MODU Drilling Rig will be anchored using 8-12 chain tensioned anchors (~20 tonnes) specific to the rig within a radius of approximately 1 – 1.5 km of the MODU Drilling Rig. It is anticipated that some anchor chain will lie on the seafloor.


It should be noted that the chain attached to any anchor is not considered a significant risk. The highest risk involved with anchoring and encountering UXO is associated with the anchor directly striking a UXO with sufficient force to cause a detonation. Any tensioning once the anchor is placed is expected to have insufficient energy to cause a detonation.

As such, in order to mitigate the risk from UXO during anchoring activities it is recommended that a controlled anchor lowering takes place to reduce the potential force exerted on any items of UXO.

RPS have been advised that, prior to anchor deployment, an ROV run would typically be conducted. This will assist in managing any residual risk present. If anything suspicious is seen during visual inspection it should be avoided when anchoring.

Appendix 1 – Site Map



00	INITIAL ISSUE	LM	JS	08/12/22
Ver	Description	By	Check	Date
Figure Number	Rev	Page		
EES1447-F-001	00	1 of 1		
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Client	ConocoPhillips	Project Number	EES1447	Drawn By	█	Status	INITIAL ISSUE
Project	Otway	Scale @ A3	1:1,500,000	Checked By	█	Date Created	08/12/2022
Title	Project Location						

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Appendix 2 – Terminology

Terminology

Explosive Ordnance Disposal (EOD) - The detection, identification, evaluation, rendering safe, recovery and disposal of UXO.

Fuze- A designed and manufactured mechanism to activate munitions. It can be designed for use by electrical, chemical or mechanical systems, by push, pull, pressure, release and time activation, singly or in combination. Usually consists of an igniter and detonator.

High Explosive (HE) - An explosive that normally detonates rather than burns; that is, the rate of detonation exceeds the velocity of sound.

Initiation - A physical process that sets in motion a cascade of chemical reactions of ever increasing energy (the explosive chain) that will eventually generate sufficient energy (the velocity of detonation) to allow the main charge to detonate in a violent, explosive chemical reaction, releasing energy in the form of heat and blast.

Snag on Vessel - UXO is snagged on submarine equipment and subsequently brought onto the vessel.

Unexploded Bomb (UXB) -The term UXB refers to any WWII aerial-delivered unexploded bomb, torpedo, projectile or mine consisting of a complete ferrous casing (without tailfins) weighing 50kg or greater.

Unexploded Ordnance (UXO) - Explosive Ordnance that has been primed, fuzed, armed or otherwise prepared for action, and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a threat to the safety and/or security of people, animals, property or material and remains unexploded either by malfunction or design or for any other reason.

UXO Contamination - UXO that is present, within any given physical context that is considered to be an impediment to the safe on-going or intended use of a facility, including geological features. Safety in this instance is measured against an acceptable level of exposure to the potential risks that UXO present.

Project: Otway Exploration Drilling, ConocoPhillips

Project Ref: EES1447

Appendix 002: Terminology



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Appendix 3 – ALARP Principle

‘ALARP PRINCIPLE’

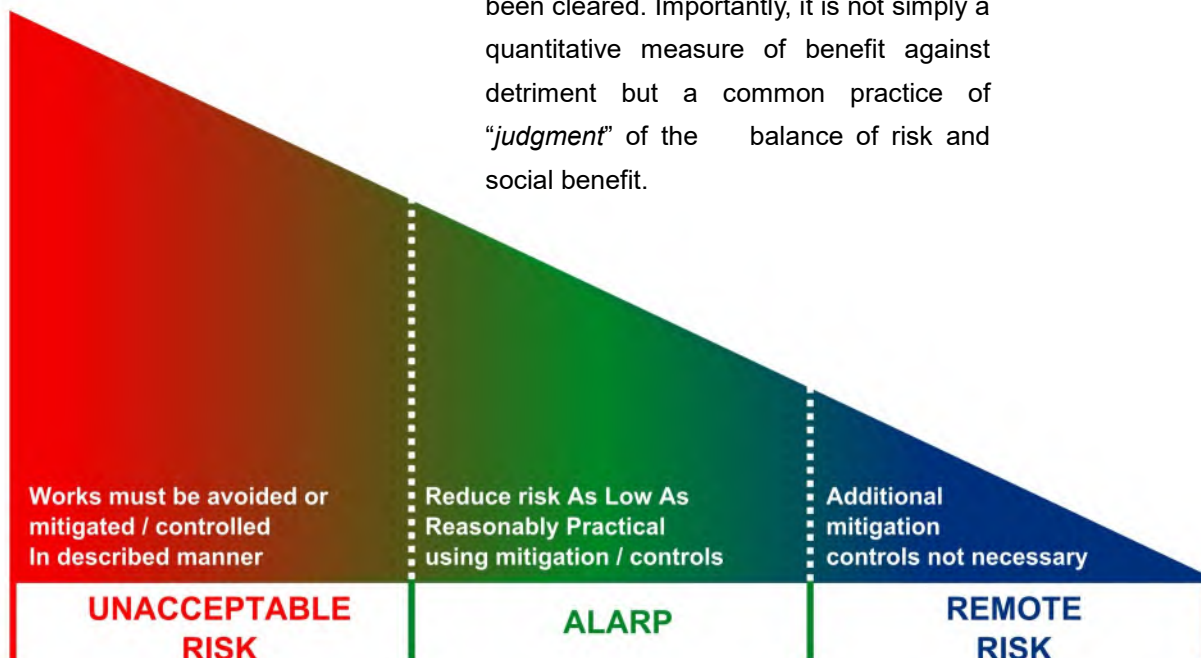
ALARP has particular connotations in UK Health and Safety law and the core concept of what is “*reasonably practicable*”. This involves weighing a risk against the effort, time and costs needed to control it, which will vary greatly dependent upon the level of UXO Hazard and the environment within which it is associated.

For a risk to be reduced in line with ALARP it must be possible to demonstrate that the cost involved in reducing the risk further would be “*grossly disproportionate*” to the benefit gained. The ALARP principle arises from the fact that it would be possible to spend infinite time, effort and money attempting to reduce a risk to zero, which may never be achievable. This is particularly true of UXO risk, where there will always remain a residual (albeit low) risk, for example from smaller UXO that is not easily detectable, or due to the limitations of survey equipment,



ALARP Resource Graph

and particularly in the marine environment where UXO can migrate after the area has been cleared. Importantly, it is not simply a quantitative measure of benefit against detriment but a common practice of “*judgment*” of the balance of risk and social benefit.



ALARP Diagram Approach

Project: Otway Exploration Drilling, ConocoPhillips

Project Ref: EES1447

Appendix 003: ALARP Principle

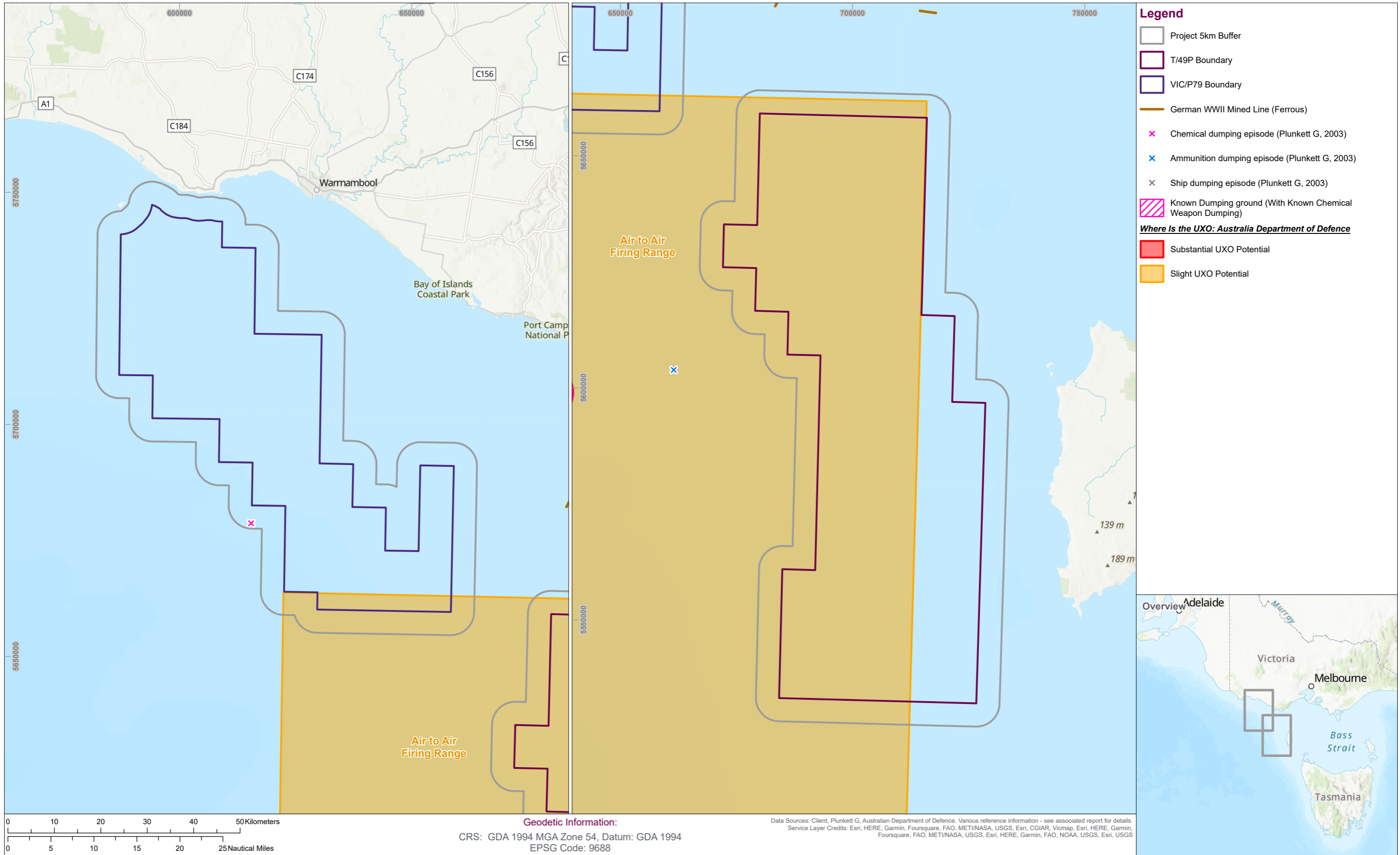


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Appendix 4 – UXO Features Map



00	INITIAL ISSUE	LM	JS	08/12/22
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Figure Number	Rev	Page		
EES1447-F-003	00	1 of 1		

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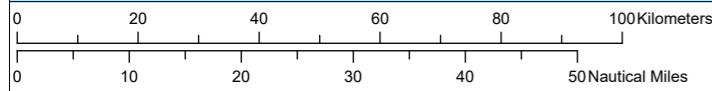
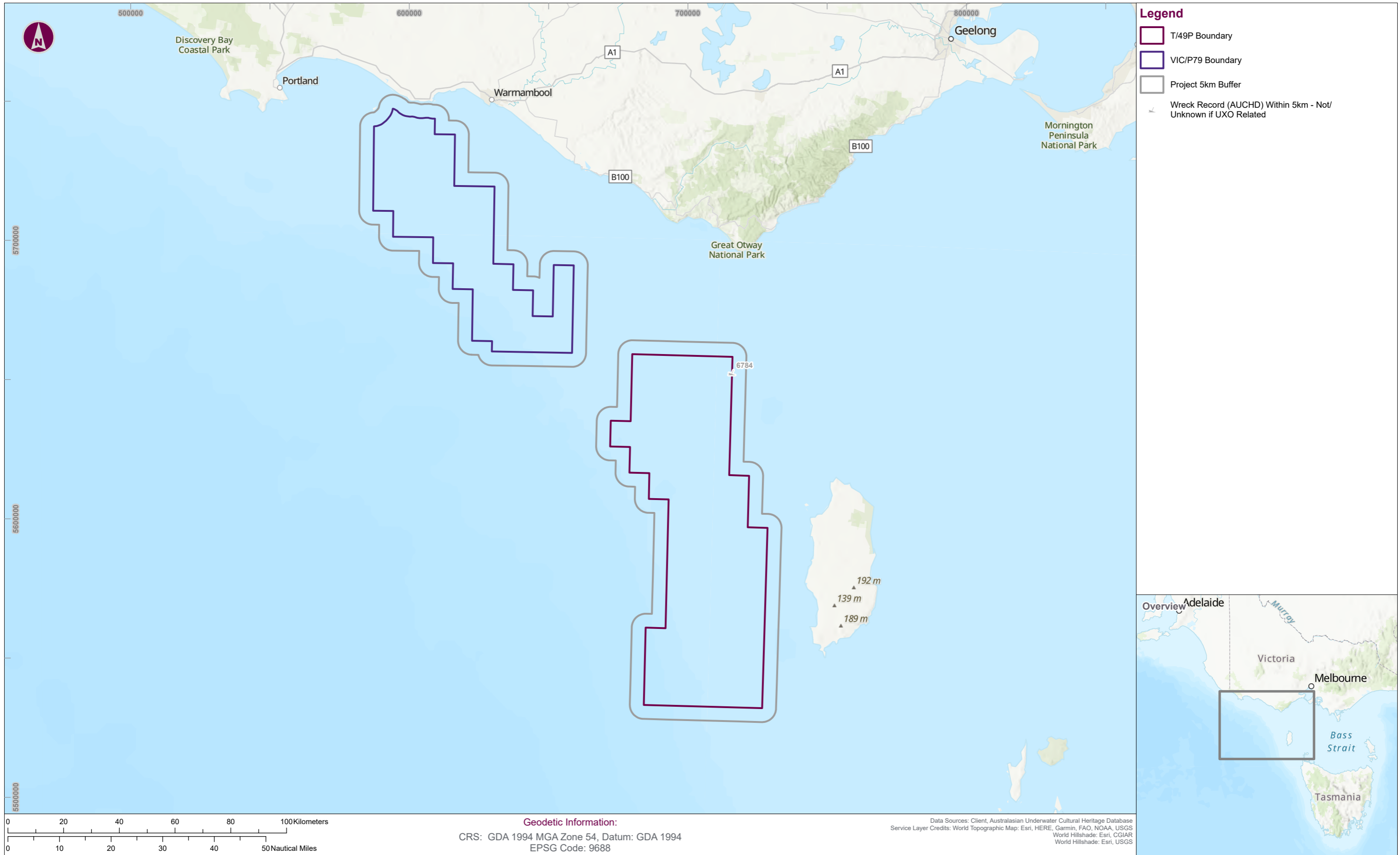
Client	ConocoPhillips	Project Number	EES1447	Drawn By	█	Status	INITIAL ISSUE
Project	Otway	Scale @ A3	1:750,000	Checked By	█	Date Created	08/12/2022
Title	UXO Related Features						

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Appendix 5 – Shipwreck Map



Geodetic Information:
 CRS: GDA 1994 MGA Zone 54, Datum: GDA 1994
 EPSG Code: 9688

Data Sources: Client, Australasian Underwater Cultural Heritage Database
 Service Layer Credits: World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
 World Hillshade: Esri, CGIAR
 World Hillshade: Esri, USGS

00	INITIAL ISSUE	LM	JS	08/12/22
Ver	Description	By	Check	Date
Figure Number	Rev	Page		
EES1447-F-002	00	1 of 1		
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Client ConocoPhillips

Project Number
EES1447

Drawn By
■

Status
INITIAL ISSUE

Project Otway

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Date Created
08/12/2022

Title Recorded Wrecks (Within 5km)

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Appendix 6 – Risk Assessment

	Activity / Pathway						
	Snag on Vessel	Anchoring	Peel Grab Operations	Borehole/Vibrocore	CPT	Grab Sampling	Well Drilling
Regular Munitions	Probability of Detonation						
Small Arms Ammunition	E	F	F	F	F	F	F
Land Service Ammunition	D	E	E	E	E	E	E
≤155mm Projectiles	D	D	E	E	E	E	E
>155mm Projectiles	D	D	E	E	E	E	E
HE Bombs	Allied Origin	C	D	E	D	E	D
	Axis Origin	C	E	E	F	F	E
Sea Mines	Allied Origin - Contact Mines	B	B	D	B	B	D
	Allied Origin - Ground Mines	D	E	E	E	E	E
	Axis Origin - Contact Mines	B	B	D	B	B	D
	Axis Origin - Ground Mines	C	D	D	D	D	D
Land Mines	D	D	E	E	E	E	
Torpedoes	C	C	E	D	D	E	D
Depth Charges	C	C	E	D	D	E	D
Conventional Dumped Munitions	D	E	E	E	E	E	E
Dumped Chemical Munitions	D	E	E	E	E	E	E
Missiles/Rockets	D	E	E	E	E	E	E

Activity / Pathway													
Snag on Vessel	Anchoring		Peel Grab Ops		Borehole/Vibrocore		CPT		Grab Sampling		Well Drilling		
Water Depth													
Surface	0m-10m	>10m	0m-10m	>10m	0m-10m	>10m	0m-10m	>10m	0m-10m	>10m	0m-10m	>10m	
Consequence of Detonation													
3	5	5	5	5	5	5	5	5	5	5	5	5	
2	5	5	5	5	5	5	5	5	5	5	5	5	
2	5	5	5	5	5	5	5	5	5	5	5	5	
2	4	5	4	5	4	5	4	5	4	5	4	5	
2	3	4	2	4	2	4	2	4	2	4	2	4	
2	3	4	2	4	2	4	2	4	2	4	2	4	
2	2	3	2	3	2	3	2	3	2	3	2	3	
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2	2	3	2	3	2	3	2	3	2	3	2	3	
2	4	5	4	5	4	5	4	5	4	5	4	5	
2	2	3	2	3	2	3	2	3	2	3	2	3	
2	2	3	2	3	2	3	2	3	2	3	2	3	
2	2	3	2	3	2	3	2	3	2	3	2	3	
2	4	4	4	4	4	4	4	4	4	4	4	4	
2	3	3	3	3	3	3	3	3	3	3	3	3	

Source: UXO

Potential Pathway: Geotechnical Investigation and Well Drilling Operations
 Potential Receptor: People, Equipment, Infrastructure, Vessels, Environment

Probability: A = high probability to F = Low probability
 Consequence: 1 = High to 5 = Low

Assumptions: Probability of detonation is based on a encountering a single item
 Consequence/Impact levels are based on the worst case consequence/impact for each tier level

Area	Approx. Depth Range (m LAT)
Zone A	>10m

UXO	Probability of Encounter on Seabed	Probability of Encounter on Vessel*
Regular Munitions		
Small Arms Ammunition	F	F
Land Service Ammunition	F	F
≤155mm Projectiles	F	F
>155mm Projectiles	F	F
HE Bombs	F	F
Allied Origin	F	F
Axis Origin	F	F
Allied Origin - Contact Mines	F	F
Allied Origin - Ground Mines	F	F
Axis Origin - Contact Mines	E	F
Axis Origin - Ground Mines	F	F
Torpedoes	F	F
Depth Charges	E	F
Conventional Dumped Munitions	E	F
Dumped Chemical Munitions	E	F
Missiles/Rockets	E	F

Activity / Pathway															
Snag on Vessel*	Risk Rating	Anchoring	Risk Rating	Peel Grab Operations	Risk Rating	Borehole/Vibrocore	Risk Rating	CPT	Risk Rating	Grab Sampling	Risk Rating	Well Drilling	Risk Rating		
Final Hazard Level															
FE3	Low	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible
FD2	Low	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible
FD2	Low	FD5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible
FD2	Low	FD5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible
FC2	Low	FD4	Low	FE4	Negligible	FD4	Low	FD4	Low	FE4	Negligible	FD4	Low	FE4	Negligible
FC2	Low	FE4	Negligible	FE4	Negligible	FF4	Negligible	FF4	Negligible	FE4	Negligible	FF4	Negligible	FF4	Negligible
FB2	Mod	FB3	Low	FD3	Low	FB3	Low	FB3	Low	FD3	Low	FB3	Low	FB3	Low
FD2	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low
FB2	Mod	EB3	Low	ED3	Low	EB3	Low	ED3	Low	EB3	Low	ED3	Low	EB3	Low
FC2	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low
FC2	Low	FC3	Low	FE3	Low	FD3	Low	FD3	Low	FE3	Low	FE3	Low	FE5	Negligible
FC2	Low	EC3	Low	EE3	Low	ED3	Low	ED3	Low	EE3	Low	ED3	Low	ED3	Low
FD2	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low
FD2	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE3	Low
FD2	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE4	Low

Probability: A = high probability to F = Low probability
Consequence: 1 = High to 5 = Low

Final Hazard Level: Encounter (Detonation - Consequence)

Risk Levels:

High
Moderate
Low
Negligible

Notes:
 For 'Hazard Levels on Seabed' the depth is stated at the top left of this page
 For 'Hazard Levels on Vessel' the depth is Surface (0 m)
 All Hazard Levels given are prior to any mitigation
 (Detonation - Consequence) Levels are taken from worksheet Hazard_Eval-1
 Snag on Vessel refers to any possibility of snagging UXO and transferring to vessel
 The final risk rating is based on the highest score for each activity
 * For encounter of Chemical Munitions on vessel, the likelihood of snag on vessel resulting from retrieval of cable is considered to be minimal but this does not include residues contaminating equipment

Area	Approx. Depth Range (m LAT)
Zone B	>10m

UXO	Probability of Encounter on Seabed	Probability of Encounter on Vessel*
Regular Munitions		
Small Arms Ammunition	F	F
Land Service Ammunition	F	F
<155mm Projectiles	E	F
>155mm Projectiles	F	F
HE Bombs	F	F
Allied Origin	E	F
Axis Origin	F	F
Allied Origin - Contact Mines	F	F
Allied Origin - Ground Mines	F	F
Axis Origin - Contact Mines	E	F
Axis Origin - Ground Mines	F	F
Torpedoes	F	F
Depth Charges	E	F
Conventional Dumped Munitions	D	E
Dumped Chemical Munitions	E	F
Missiles/Rockets	E	F

Activity / Pathway															
Snag on Vessel*	Risk Rating	Anchoring	Risk Rating	Peel Grab Operations	Risk Rating	Borehole/Vibrocore	Risk Rating	CPT	Risk Rating	Grab Sampling	Risk Rating	Well Drilling	Risk Rating		
Final Hazard Level															
FE3	Low	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible		
FD2	Low	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible		
FD2	Low	ED5	Low	EE5	Negligible	EE5	Negligible	EE5	Negligible	EE5	Negligible	EE5	Negligible		
FD2	Low	FD5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible		
FC2	Low	ED4	Low	EE4	Low	ED4	Low	ED4	Low	EE4	Low	ED4	Low		
FC2	Low	FE4	Negligible	FE4	Negligible	FF4	Negligible	FF4	Negligible	FE4	Negligible	FF4	Negligible		
FB2	Mod	FB3	Low	FD3	Low	FB3	Low	FB3	Low	FD3	Low	FB3	Low		
FD2	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low		
FB2	Mod	EB3	Low	ED3	Low	EB3	Low	ED3	Low	ED3	Low	EB3	Low		
FC2	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low		
FC2	Low	FC3	Low	FE3	Low	FD3	Low	FD3	Low	FE3	Low	FE5	Negligible		
FC2	Low	EC3	Low	EE3	Low	ED3	Low	ED3	Low	EE3	Low	ED3	Low		
ED2	Low	DE3	Low	DE3	Low	DE3	Low	DE3	Low	DE3	Low	DD3	Low		
FD2	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE3	Low		
FD2	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE4	Low		

Probability: A = high probability to F = Low probability
Consequence: 1 = High to 5 = Low

Final Hazard Level: Encounter (Detonation - Consequence)

Risk Levels:

High
Moderate
Low
Negligible

Notes:
 For 'Hazard Levels on Seabed' the depth is stated at the top left of this page
 For 'Hazard Levels on Vessel' the depth is Surface (0 m)
 All Hazard Levels given are prior to any mitigation
 (Detonation - Consequence) Levels are taken from worksheet Hazard_Eval-1
 Snag on Vessel refers to any possibility of snagging UXO and transferring to vessel
 The final risk rating is based on the highest score for each activity
 * For encounter of Chemical Munitions on vessel, the likelihood of snag on vessel resulting from retrieval of cable is considered to be minimal but this does not include residues contaminating equipment

Area	Approx. Depth Range (m LAT)
Zone C	>10m

UXO	Probability of Encounter on Seabed	Probability of Encounter on Vessel*
Regular Munitions		
Small Arms Ammunition	F	F
Land Service Ammunition	F	F
≤155mm Projectiles	E	F
>155mm Projectiles	F	F
HE Bombs	F	F
Allied Origin	E	F
Axis Origin	F	F
Allied Origin - Contact Mines	F	F
Allied Origin - Ground Mines	F	F
Axis Origin - Contact Mines	E	F
Axis Origin - Ground Mines	F	F
Torpedoes	F	F
Depth Charges	E	F
Conventional Dumped Munitions	D	E
Dumped Chemical Munitions	E	F
Missiles/Rockets	F	F

Activity / Pathway															
Snag on Vessel*	Risk Rating	Anchoring	Risk Rating	Peel Grab Operations	Risk Rating	Borehole/Vibrocore	Risk Rating	CPT	Risk Rating	Grab Sampling	Risk Rating	Well Drilling	Risk Rating		
Final Hazard Level															
FE3	Low	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible
FD2	Low	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible
FD2	Low	ED5	Low	EE5	Negligible	EE5	Negligible	EE5	Negligible	EE5	Negligible	EE5	Negligible	EE5	Negligible
FD2	Low	FD5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible
FC2	Low	ED4	Low	EE4	Low	ED4	Low	ED4	Low	EE4	Low	ED4	Low	ED4	Low
FC2	Low	FE4	Negligible	FE4	Negligible	FF4	Negligible	FF4	Negligible	FE4	Negligible	FF4	Negligible	FF4	Negligible
FB2	Mod	FB3	Low	FD3	Low	FB3	Low	FB3	Low	FD3	Low	FB3	Low	FB3	Low
FD2	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low
FB2	Mod	EB3	Low	ED3	Low	EB3	Low	ED3	Low	ED3	Low	EB3	Low	ED3	Low
FC2	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low
FC2	Low	FC3	Low	FE3	Low	FD3	Low	FD3	Low	FE3	Low	FE3	Low	FE5	Negligible
FC2	Low	EC3	Low	EE3	Low	ED3	Low	ED3	Low	EE3	Low	ED3	Low	ED3	Low
ED2	Low	DE3	Low	DE3	Low	DE3	Low	DE3	Low	DE3	Low	DD3	Low	DD3	Low
FD2	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE3	Low	EE3	Low
FD2	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE4	Negligible	FE4	Negligible

Probability: A = high probability to F = Low probability
Consequence: 1 = High to 5 = Low

Final Hazard Level: Encounter (Detonation - Consequence)

Risk Levels:

High
Moderate
Low
Negligible

Notes:
 For 'Hazard Levels on Seabed' the depth is stated at the top left of this page
 For 'Hazard Levels on Vessel' the depth is Surface (0 m)
 All Hazard Levels given are prior to any mitigation
 (Detonation - Consequence) Levels are taken from worksheet Hazard_Eval-1
 Snag on Vessel refers to any possibility of snagging UXO and transferring to vessel
 The final risk rating is based on the highest score for each activity
 * For encounter of Chemical Munitions on vessel, the likelihood of snag on vessel resulting from retrieval of cable is considered to be minimal but this does not include residues contaminating equipment

Area	Approx. Depth Range (m LAT)
Zone D	>10m

UXO	Probability of Encounter on Seabed	Probability of Encounter on Vessel*
Regular Munitions		
Small Arms Ammunition	F	F
Land Service Ammunition	F	F
≤155mm Projectiles	F	F
>155mm Projectiles	F	F
HE Bombs	F	F
Allied Origin	F	F
Axis Origin	F	F
Allied Origin - Contact Mines	F	F
Allied Origin - Ground Mines	F	F
Sea Mines	F	F
Axis Origin - Contact Mines	E	F
Axis Origin - Ground Mines	F	F
Torpedoes	F	F
Depth Charges	E	F
Conventional Dumped Munitions	E	F
Dumped Chemical Munitions	E	F
Missiles/Rockets	F	F

Activity / Pathway															
Snag on Vessel*	Risk Rating	Anchoring	Risk Rating	Peel Grab Operations	Risk Rating	Borehole/Vibrocore	Risk Rating	CPT	Risk Rating	Grab Sampling	Risk Rating	Well Drilling	Risk Rating		
Final Hazard Level															
FE3	Low	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible	FF5	Negligible		
FD2	Low	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible		
FD2	Low	FD5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible		
FD2	Low	FD5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible	FE5	Negligible		
FC2	Low	FD4	Low	FE4	Negligible	FD4	Low	FD4	Low	FE4	Negligible	FD4	Low		
FC2	Low	FE4	Negligible	FE4	Negligible	FF4	Negligible	FF4	Negligible	FE4	Negligible	FF4	Negligible		
FB2	Mod	FB3	Low	FD3	Low	FB3	Low	FB3	Low	FD3	Low	FB3	Low		
FD2	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low		
FB2	Mod	EB3	Low	ED3	Low	EB3	Low	EB3	Low	ED3	Low	EB3	Low		
FC2	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low	FD3	Low		
FC2	Low	FC3	Low	FE3	Low	FD3	Low	FD3	Low	FE3	Low	FE5	Negligible		
FC2	Low	EC3	Low	EE3	Low	ED3	Low	ED3	Low	EE3	Low	ED3	Low		
FD2	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	EE3	Low	ED3	Low		
FD2	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE4	Low	EE3	Low		
FD2	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE3	Low	FE4	Negligible		

Probability: A = high probability to F = Low probability
Consequence: 1 = High to 5 = Low

Final Hazard Level: Encounter (Detonation - Consequence)

Risk Levels:

High
Moderate
Low
Negligible

Notes:
 For 'Hazard Levels on Seabed' the depth is stated at the top left of this page
 For 'Hazard Levels on Vessel' the depth is Surface (0 m)
 All Hazard Levels given are prior to any mitigation
 (Detonation - Consequence) Levels are taken from worksheet Hazard_Eval-1
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 * For encounter of Chemical Munitions on vessel, the likelihood of snag on vessel resulting from retrieval of cable is considered to be minimal but this does not include residues contaminating equipment

Appendix 7 – Consequence Levels

		EXPECTED CONSEQUENCES / IMPACTS			
		Human Health/ Safety	Environment	Financial Impact	
				Plant and Equipment	Structures
CONSEQUENCE LEVEL	1	Fatalities Over Extended Area	Major – Full Scale Response Required	Multiple Unit Destruction	Widespread Structural Collapse
	2	Localised Fatalities	Major – Full Scale Response Required	Unit Destruction	Localised Structural Collapse
	3	Serious Injury	Serious Resource Required	Component Replacement / Repairs Required	Structural Damage
	4	Injury Requiring Medical Treatment	Moderate/Limited Response Required	Superficial Damage	Non-Structural / Superficial Damage
	5	Minor Impact/First Aid	Minor Response Required	Minor/ No notable effect	Minor/ No notable effect

Probability Level	
A	Highly Probable
B	Probable
C	Possible
D	Remote
E	Improbable
F	Highly Improbable

Project: Otway Exploration Drilling, ConocoPhillips

Project Ref: EES1447

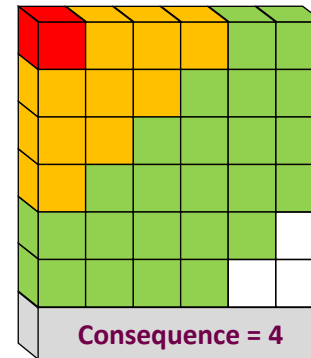
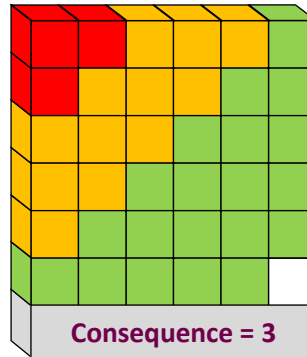
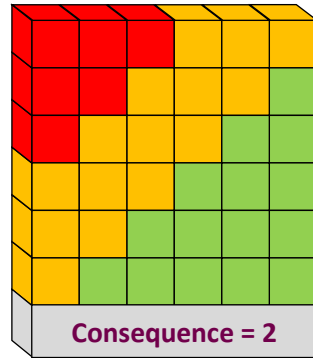
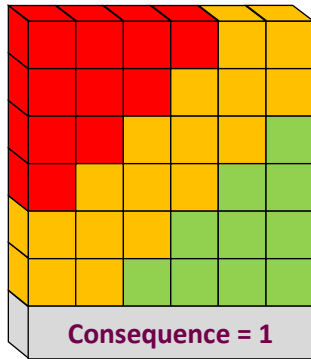
Appendix 007: Consequence Levels 1 of 2



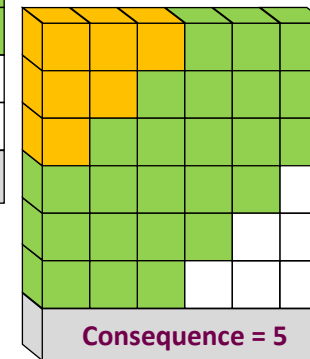
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Probability of Encounter, P_E					
A	B	C	D	E	F



Probability of Detonation, P_D					
A	B	C	D	E	F

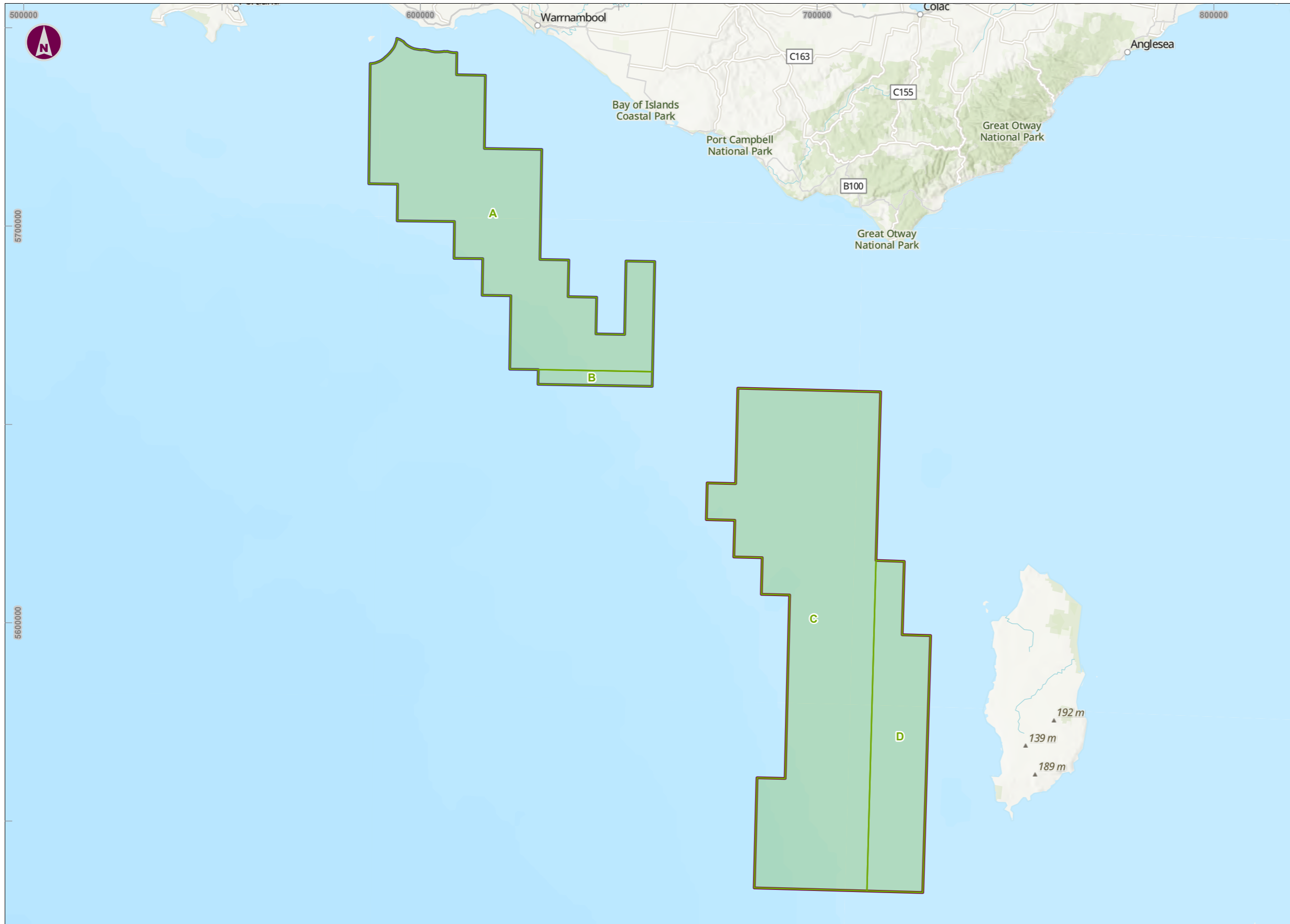
Risk Level
High
Moderate
Low
Negligible

Project: Otway Exploration Drilling, ConocoPhillips

Project Ref: EES1447

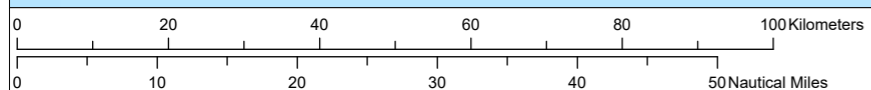
Appendix 007: Consequence Levels 2 of 2

Appendix 8 – Risk Zone Map



Legend

- T/49P Boundary
- VIC/P79 Boundary
- Low UXO Risk



Geodetic Information:
 CRS: GDA 1994 MGA Zone 54, Datum: GDA 1994
 EPSG Code: 9688

Service Layer Credits: Esri, HERE, Garmin, Foursquare, FAO, MET/NASA, USGS, Esri, CGIAR, Esri, HERE, Garmin, FAO, NOAA, USGS, Esri, USGS

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Project Otway
Title UXO Risk Zoning

Project Number
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APPENDIX L CULTURAL HERITAGE REPORT



Otway Exploration
Cultural heritage desktop assessment

Prepared for ConocoPhillips Australia Pty Ltd

1 November 2023

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Executive summary

Biosis Pty Ltd was commissioned by Conoco Phillips to undertake a cultural heritage desktop assessment for the proposed resource exploration in Bass Strait.

The purpose of this report is to explore cultural heritage and cultural heritage landscapes to understand Country, and Sea Country within and surrounding the project area in order to provide the project a grounding in Aboriginal cultural heritage. This short report will describe the known cultural environment, include a brief ethnohistory and history, and analysis of previous studies.

The study area includes the proposed permit areas (the location of the exploration zone(s)), where seabed surveys and drilling exploration may occur. In general, the permit areas are located south of Port Fairy and the Great Otway National Park, and west of King Island.

The study area consists of a large geographical area noted as the 'Investigation Area for the Identification of Values and Sensitivities' which is based on stochastic modelling of oil spills, generating a statistical area where impacts may occur under many eventualities. This modelling predicts potential oil spill outcomes over many different variables to generate an investigation area for potential impacts.

Due to the significant size of the study area, it is broken into three areas for discussion in parts of this report and for the Communication Plan (CP), this includes:

1. Primary Traditional Owner area (Victoria) – the area directly surrounding the proposed permit areas and adjacent coastlines
2. Secondary Traditional Owner area – the wider area affected by the modelling of oil spills
3. Primary Traditional Owner area (Tasmania) – North and Northwest Tasmania and the Bass Strait islands

Within the study area, along the Victorian coast, there are 5636 registered Aboriginal places with the most common site types being shell middens, artefact scatters and LDADs. Shell middens are typically found along the coastline, whereas artefact scatters, while also being found along the coast, are varied and move inland following freshwater sources, likely to be indicative of past inland-coastal travel routes. LDADs are also typically found further inland than shell middens and artefact scatters, indicative of widespread use of the landscape in the past, rather than concentrations and repeated patterning.

In light of a review of Aboriginal places within the study area, there is a high likelihood for Aboriginal cultural heritage material to be present within the areas subject to potential impact.

On the Tasmanian coast, Aboriginal heritage should be expected in any area of low-lying coastal areas, shelter sites, and sources of food, water and raw materials. These coastal margins contain all Tasmanian Aboriginal site types. It is also known on the West Coast of Tasmania, that a number of rock art sites are located on the coast, many either close or in tidal margins (Dix pers. obs.). Large midden sites are also located very close to the waters edge, as well as some stone quarry sites within tidal margins (Dix pers .obs.).

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1 Introduction

1.1 Acknowledgement

Biosis acknowledges that the authors of this assessment identify as non-Aboriginal Australians living on Bunurong and Wurundjeri Countries. We acknowledge that they interpret, present and understand the past through their own cultural lens. In writing this report about Aboriginal living culture including their cultural heritage and the events following the commencement of colonisation, we pay our respects to Elders past, present and emerging and recognise that Country is unceded.

The authors acknowledge the inherent racism, cultural ignorance and political agendas imbedded within ethnographic sources at the time of, and following, colonisation.

Traditional Owners are the owners of all Traditional knowledge. Traditional knowledge and cultural values remain the intellectual property of the Traditional Owners and the interpretation and understanding of cultural values must be undertaken in genuine consultation with Aboriginal people.

1.2 Scope of works

Biosis Pty Ltd was commissioned by Conoco Phillips to undertake a cultural heritage desktop assessment for the proposed resource exploration in Bass Strait.

It must be emphasised, that this report is not intended to meet the requirements of a formal assessment under First Peoples – State Relations, Heritage Victoria, Aboriginal Heritage Tasmania or Heritage Tasmania guidelines.

The purpose of this report is to explore cultural heritage and cultural heritage landscapes to understand Country, and Sea Country within and surrounding the project area in order to provide the project a grounding in Aboriginal cultural heritage. This short report will describe the known cultural environment, include a brief ethnohistory and history, and analysis of previous studies.

In regard to Tasmanian Aboriginal site data, no Aboriginal Heritage Register Search (AHR Search) was conducted due to time constraints and the need for greater consultation with the Tasmanian Aboriginal Community. The large search area would have encompassed the vast majority of coastal sites within the state of Tasmania, which includes highly significant and sacred sites. As such, it is highly recommended that in-person consultation occurs with the Aboriginal Heritage Council (AHC) and Aboriginal Heritage Tasmania (AHT) so that proper and respectful management of their data can occur. Therefore, the details of this report referring to Tasmania are based on freely accessible published materials.

1.3 Study area

The extent of the study area is shown in Figure 1.

The study area includes the proposed permit areas (the location of the exploration zone(s)), where seabed surveys and drilling exploration may occur. In general, the permit areas are located south of Port Fairy and the Great Otway National Park, and west of King Island.

The study area consists of a large geographical area noted as the 'Investigation Area for the Identification of Values and Sensitivities' which is based on stochastic modelling of oil spills, generating a statistical area where

impacts may occur under many eventualities. This modelling predicts potential oil spill outcomes over many different variables to generate an investigation area for potential impacts.

Due to the significant size of the study area, it is broken into three areas for discussion in parts of this report and for the Communication Plan (CP), this includes:

4. Primary Stakeholder area (Victoria) – the area directly surrounding the proposed permit areas and adjacent coastlines
5. Secondary Stakeholder area – the wider area affected by the modelling of oil spills
6. Primary Stakeholder area (Tasmania) – North and Northwest Tasmania and the Bass Strait islands

1.4 Heritage Advisor/Authorship

██████████ has recently started her career in the Heritage Industry by initially interning at Biosis from August 2022 to September 2022, to her current role as a Graduate Heritage Consultant. Within her internship, ██████ learnt and completed many techniques and processes such as aiding in background research to Cultural Heritage Management Plans, illustrating stratigraphic contexts and subsurface field testing. ██████ also gained experience in field photography, rock art and heritage building surveys. ██████ has been a part of several projects since she was an intern, gaining knowledge of several systems, such as HERMES and ACHRIS.

██████████ completed her Bachelor of Archaeology at LaTrobe University at the end of 2022 and will start further study in 2024.

██████████ BArch(Hons)

██████████ (B Arch Hons (2007)) is an Archaeologist and Heritage Advisor, with over 15 years' experience as a heritage consultant. ██████ is the Technical Director for heritage in Victoria and specialises in project management, community liaison and the resolution of complex cultural heritage issues in varying situations. ██████ provides specialist cultural heritage legislative advice and completes technical reports to meet the requirements of heritage legislation. ██████ has broad experience completing various heritage assessments, including over 60 Cultural Heritage Management Plans (CHMPs). ██████ carries out cultural heritage inductions, salvages, and other compliance requirements for completed CHMPs. ██████ has also completed Due Diligence Assessments, Heritage Impact Assessments, "Consents to Disturb" and other permit applications, conservation management plans, and heritage reports. ██████ has also assisted on a wide variety of other heritage projects, including as an expert witness and with planning and overlay applications, strategic advice, and continues to work towards completing projects to best practice standards.

██████████ is a full member of the Australian Association of Consulting Archaeologists and is a listed heritage advisor under the *Aboriginal Heritage Act 2006*.

Dr ██████████ BA(Hons), PhD, MCIfA

██████████ has worked in archaeology and heritage management since 2007. ██████ has undertaken numerous archaeological projects around Australia and has worked in consulting, government, teaching and museums in Victoria, Tasmania, Northern Territory, Western Australia, the United Kingdom, Middle East, and South Africa. ██████ completed his Bachelor of Arts with First Class Honours where his thesis focussed on hand stencil rock art. After a break from university to undertake consulting, government and teaching based archaeological work, ██████ returned to complete his PhD at Griffith University where he was the recipient of the Australian Research Council Laureate Scholarship in 2016. His thesis explored contact archaeology in

Arnhem Land, and how people reacted to change through what was depicted in rock art. [REDACTED] is a registered heritage advisor under the Victorian *Aboriginal Heritage Act 2006*.

1.5 Traditional Owner Groups

It is not within the remit of this report to undertake consultation with Traditional Owner groups, industry bodies or other stakeholders. No consultation was undertaken. Stakeholder and Traditional Owner engagement is considered in the Communication Plan (CP). In Victoria, Traditional Owner groups are represented by the relevant Registered Aboriginal Party (RAP). There are five RAPs registered in the study area, including the Gunditjmarra, Eastern Maar, Wadawurrung, Bunurong, and Gunaikurnai.

In Tasmania, the Traditional Owner group is referred to collectively as the Palawa, and are not represented by a representative or governing body.

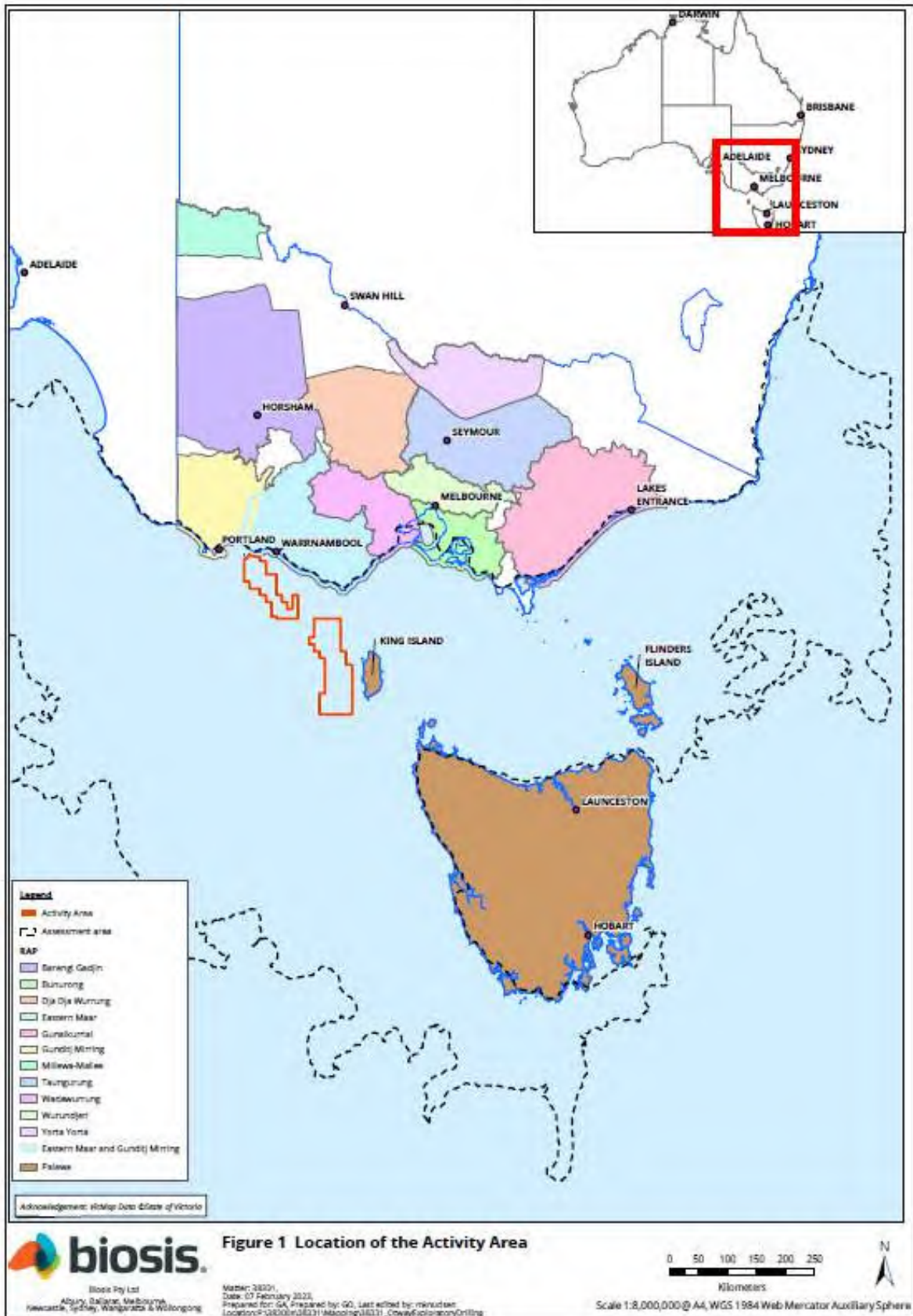


Figure 1 Extent of the study area and Traditional Owner groups

2 Background review

2.1 Geology and geomorphology

The Bass Strait is the stretch between the south of the Australian mainland and north of the Tasmanian state. The Bass Strait formed during the last glacial period, also known as the Last Ice Age, which occurred between 110,000 and 12,000 years ago (Williams et al. 2018, p. 149). During this time, the Earth's climate was much cooler and global sea levels were much lower due to the large amount of water that was locked up in glaciers and ice sheets.

As the climate began to warm and the glaciers began to melt, sea levels began to rise. This process caused the land bridge that connected Tasmania to mainland Australia to be gradually flooded eventually forming the Bass Strait as we know it today.

This gradual flooding is therefore known to have occurred within the period of human occupation in southeastern Australia – the diaspora of people from Victoria to Tasmania occurred prior to the total flooding of the strait, across a land bridge for which archaeological evidence may be buried deep below the ocean (Lourandos 1997, p. 244). Evidence for this indicates people crossed the land bridge from Victoria to Tasmania at 35,000 years ago (Lourandos 1997, p. 254). In addition, dreaming stories of both Victorian and Tasmanian Aboriginal communities further reinforce the memories and songlines relating to the flooding and connection to Sea Country of coastal communities (Nunn & Reid 2016).

2.1.1 Bass Strait, Islands and the land bridge

The Bass Strait is bordered on the west by King Island and the King Island Rise and on the east by Flinders Island and the Bassian Rise, with an approximated depth of between 60 and 80 metres (Harris & Heap 2009, Robinson 1974). The predominant deposits within the Bass Strait consist of Tertiary sediments overlaid on early Cretaceous deposits. The sediments in the early Cretaceous period contained combinations of shale, siltstone, sandstone, while a variety of marl, mudstone, limestone and shale can be seen in the later deposits (Robinson 1974).

Phillip Island's geomorphology is centred around Quaternary limestone dunes with higher-level shore platforms that were formed by Quaternary sea levels (Birch 2003). French Island is boarded by sandy sheets, similar to Western Port Sunkland. Port Phillip Bay is the lowest part of the Sunklands and is currently flooded due to Quaternary sea-level fluctuations in the Last Glacial Maximum (Birch 2003, p. 556). Also during this period the Yarra River water levels had risen and spilled over the coastal plain, forming what is now known as the Bass Strait (Birch 2003, p. 556).

2.1.2 The Victorian Coast

The coastal plains of southwest Victoria are made up of both Tertiary and Quaternary marine and nonmarine sediments, formed on calcareous sands and sandy limestones, overlaid with dune ridges and beaches that were formed during the last 800 000 years. The dune ridges closer to the coast are younger than those further inland and are comprised of calcareous sands. Caves are common in ridges of the limestone sands (Birch 2003, p. 545).

The coastline of western Victoria is seen to have several layers of sedimentary deposits, as evident in the cliffs often found, containing stratigraphic sections of basalt, limestone and clay (Birch 2003, p. 555).

The geomorphic evolution of southeast coastal plains of Victoria is varied, with Tertiary overlaying early Cretaceous sediments on the Otway coast as well as Quaternary sand and limestone dunes in Mornington

Peninsula and Phillip Island (Birch 2003, pp. 547,556). The coast of East Gippsland is covered extensively in coastal dunes, with intermittent pockets of Pleistocene deposits. Parabolic dunes formed from Pleistocene and Holocene age deposits are also located in this area (Birch 2003, p. 557).

2.1.3 The Tasmanian Coast

The Tasmanian coast consists of varying deposits making up its rugged nature. Geological formations include Dolerite, Sandstone, Mudstone, Granite, Limestone, and other Volcanic rocks. These varying geologies are reflected in high cliffs and outcrops, dune-backed beaches, sea stacks and arches. The Tasmanian geological makeup is complex and varies. Along the coastal regions detailed in the study area, these consist of Devonian granites, Tertiary Basalt, Neoproterozoic dolomite, Cambrian boninite, Cambrian Sediment, and Mesoproterozoic quartzite (MRT: 2022).

Tasmania is known to have been one of the few areas in the southern hemisphere that was glaciated during the Pleistocene (MRT 2002). This generally occurred in higher regions of the state and influenced many of the earlier Pleistocene sites recorded in Tasmania (MRT 2022).

2.1.4 Archaeology of the Sea Floor

Archaeology of the sea floor is an emerging aspect of archaeological science. Throughout the world, archaeological investigations have shown that there is evidence for human occupation to be recovered below current sea levels. Investigations in the Sunda Shelf, Southeast Asia demonstrates the impact of sea level rise at approximately 12,000 years ago, with the investigation of settlements, fish traps, and other structures. Other investigations have occurred in India (Kumar 2021), and the Black Sea (Ryan 2003), investigating more recent sea level change, around 7,500 years ago. In the UK and US, the offshore wind industry is required to complete offshore archaeological investigations including desk-based studies and field survey.

In comparison, Bass Strait is comparable to the vanished landscape of Doggerland that was submerged similarly in rising sea levels during the Mesolithic Period. Like the Bassian Plain, Doggerland formed a land bridge between the United Kingdom and Europe. Works by marine archaeologists have found that many artefacts and environmental sediments still remain from this now vanished ancient landscape (Gaffney et al. 2007). It is even suggested by Weninger et al (2008) that this was caused by a catastrophic flood. However, such ideas are not believed in the example of Bass Strait, and that this was a more gradual separation (see Davidson and Roberts 2008:20)

In Victoria, limited investigations have been completed, however the use of LiDAR and shoreline mapping has occurred. In particular, Gunditjmarra have worked with Extent Heritage in partnership with Wessex Archaeology in determining the location of prior shorelines with the use of remote sensing. Should archaeological evidence survive, it is likely that the previous shorelines would provide the most likely locations for this. Physical investigations are likely to be difficult, complex, and costly.

Following deposition, archaeological evidence of human occupation along the Bass Strait has flooded. Since flooding, sedimentation has also occurred, capping any archaeological evidence deep below the current sea floor. The depth of sedimentation varies throughout the strait, however combined with deep waters (400 to 5,500 metres) and harsh conditions, exploration of sea floor archaeology utilising physical methods in this area is currently unlikely.

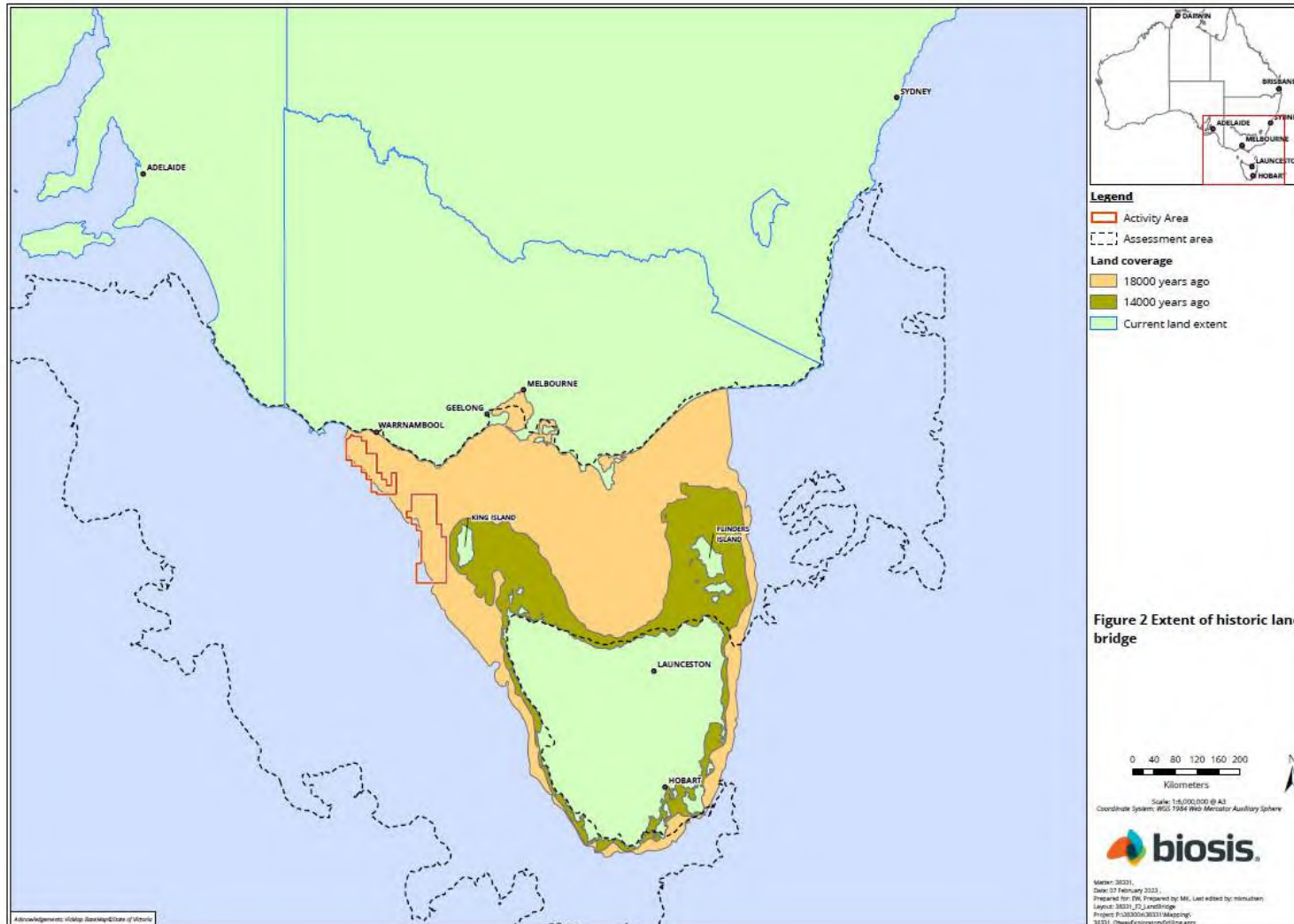


Figure 2 Land Bridge and activity area

2.2 Land use history

Permanent European colonisation of Victoria and Tasmania occurred first in Tasmania, in 1803, and Victoria in 1835. Earlier exploration and transitory, temporary or failed settlements occurred in the two states. Early settlements in Tasmania were penal, with free settlement commencing following. The Gold Rush in Victoria in the 1850s resulted in the rapid expansion of population and the establishment of towns throughout the state. Agriculture and Industry heavily influenced the growth of the population of Tasmania.

Settlement, population growth and utilisation of land for agricultural purposes has resulted in the spread of disease, displacement, and violence to Indigenous communities, leading to a significant decline in population and disruption to traditional cultural practice. Aboriginal people were subject to forced displacement and assimilation, including the forced removal of Aboriginal children, from the 1800s up until the 1970s. Overall the impact of colonisation on Aboriginal people has been devastating.

In regard to the remains of physical cultural heritage (such as sites and places), the practice of archaeology has increased the knowledge of Aboriginal occupation of the land in the past. The potential for archaeology to shed light on Aboriginal connections to Country has been realised with increasing frequency due to relatively recent legislative requirements. Archaeology is, however, a finite resource which has also been impacted by the effects of population growth, construction, land clearance, resource extraction, and climate change. Self-determination for Aboriginal people in regard to ownership of cultural heritage and knowledge has resulted in increased investigations led by Aboriginal people supported by technical experts, following research pathways set by the communities themselves.

Archaeological sites are located throughout the land and adjacent seascape and consist of the physical remains of the way people used the land in the past. Places may reflect resource extraction (such as scarred trees, stone quarries); be evidence of settlement (such as stone huts), manufacture (stone artefact scatters) and cultural practices (such as painting, etchings, and stone arrangements); food consumption (shell middens, earth mounds and hearths); and ritual practice (such as burials). Other cultural values can take the form of intangible places or be recorded in historic (ethnographic) references.

Whilst long-lasting, archaeological sites are heavily affected, and frequently destroyed, by the effects of modern, and past, impacts. Land clearance and increasingly intense bushfires result in the removal of old growth trees, including those showing cultural scarring, and also increases the effects of erosion. Ploughing for agricultural practices displace artefact scatters and deflate earth mounds. Coastal erosion, coastal change and increased storm surges destroys shell middens and artefact scatters located in coastal and offshore landforms. The practice of archaeology itself is destructive and results in the loss of archaeological places. Alteration of the natural environment also affects intangible values, affecting connections between the Dreamtime and the landscape, for example, by interrupting songlines. As Aboriginal people have strong connections to Country, effects on the natural environment, the land, sea, and animals, also have strong effects on Aboriginal people.

2.3 Aboriginal heritage – registered archaeological places in the study area

A search of the Victorian Aboriginal Heritage Register (VAHR) was undertaken by Emily Ward, Biosis Pty Ltd on the 21 of December 2022 utilising access number 11456. The search area was set by the study area and consists of the entire Victorian coastline.

The search identified 5636 recorded Aboriginal places within the study area (Table 1).

The dominant Aboriginal place types in the study area are shell middens (n=2639, 46.82%), artefact scatters (n=2210, 39.21%) and low density artefact distribution also known as LDADs (n=321, 5.70%). Other place types include earth features (n=181, 3.21%), object collections (n=160, 2.84%), Aboriginal Ancestral Remains (Burial) (n=51, 0.90%), scarred trees (n=42, 0.75%), stone features (n=12, 0.21%), quarries (n=9, 0.16%), Aboriginal historical places (n=8, 0.14%), Aboriginal Ancestral Remains Reinterments (n=2, 0.04%) and rock art (n=1, 0.012%).

Object Collections represent places that have been removed from the context in which they were originally recorded. More specifically, they represent the location of stored artefacts (i.e. heritage consultancies, museums, private collections) or places where artefacts have been repatriated; therefore, Object Collections are not necessarily representative of the archaeological character of the region

Due to most of the search area being coastal, the dominance of shell middens in the study area is not surprising. Middens represent the repeated consumption of coastal resources (predominantly shells of rocky or sandy shore types, such as mussel, pipi, oyster, turban) and consist of the discarded shell. Other objects may be discarded within the midden, such as bones (seal and bird are common), and artefacts. The shells and other items were discarded in discrete areas over time, some middens are small consisting of a smaller number of meals or individuals, others are larger, indicating multiple meals, some revisited over many hundreds, or thousands, of years (Frankel 2017, p.38).

'Archaeological evidence from Victoria indicates that occupation of coastal areas is as old as the present coastline – about 6000 years. Most coastal occupation sites in Victoria, however, are 4000 years old or younger' (National Oceans Office, 2002:80)

Within the study area the Traditional Owner group with the most registered Aboriginal places is Bunurong with 1486 place registrations, with 26.37% of the total registered sites in the study area. This is then followed by Gunditjmara with 853 registered sites (15.77%), then Eastern Maar with 853 registered sites (15.13%), Wadawurrung with 798 registered sites (14.16%), Gunaikurnai with 700 registered sites (12.42%) and the area of overlap of Gunditjmara and Eastern Maar has 88 registered sites (1.56). The area within the study area that has no registered RAP group has a total of 822 registered sites (14.16%). The specifics of each group are discussed below.

The areas of Bellarine Peninsula, Mornington Peninsula and French Island and Wilson's Promontory have been searched specifically on the Victorian Aboriginal Heritage Register (VAHR) as they are distinctive landforms on the coastline of Victoria and hold distinct cultural patterning, regarding both tangible and intangible cultural heritage values. These three areas contribute 1775 of the registered sites (31.5%), out of the 5636 total registered sites in the study area; The Bellarine Peninsula has 578 registered sites, Mornington Peninsula and French Island have 813 registered sites and Wilson's Promontory has 384 registered sites.

Table 1 – Aboriginal places within the study area (Victoria)

Aboriginal Place Type	Total number of sites	Percentage of sites
Aboriginal Ancestral Remains (Burial)	51	0.90%
Aboriginal Ancestral Remains (Reinternment)	2	0.04%
Aboriginal Historical Place	8	0.14%
Artefact Scatter	2210	39.21%
Earth Feature	181	3.21%
LDAD	321	5.70%
Object Collection	160	2.84%
Quarry	9	0.16%
Rock Art	1	0.012%
Scarred Tree	42	0.75%
Shell Midden	2639	46.82%
Stone Feature	12	0.21%
Total	5636	100%

2.3.1 Primary Traditional Owner Area - Gunditjmara Aboriginal places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 889 recorded Aboriginal places within the Gunditjmara RAP area. The dominant Aboriginal place types in the study area are artefact scatters (47.36%), shell middens (38.81%) and LDADs (6.3%).

Artefact scatters have been registered throughout the search area, with notable clusters of artefact scatters south of Portland, around Point Danger. Low Density Artefact Distributions (LDADs) consisting of fewer artefacts less densely present than artefact scatters, are most often found further inland, compared to artefact scatters and shell middens which are located close to the shoreline. This suggests concentration of activity close to the coast, and increased transitory movement to and from the coast, as material is being discarded when people are moving across the landscape.

Other registered place types include earth features (6.3%), object collection (0.56%), Aboriginal historic places (0.34%), Aboriginal Ancestral Remains Burial (0.11%), quarry (0.11%) and scarred trees (0.11%) There are no registered sites in the western most area of the Gunditjmara RAP group, within the study area. This area is along the southern most point of the Fitzroy River and west of Narrawong.

2.3.2 Primary Traditional Owner Area - Eastern Maar Aboriginal places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 853 recorded Aboriginal places within the Eastern Maar RAP area. The dominant Aboriginal place types in the study area are shell middens (53.81%), artefact scatters (34.11%) and earth features (5.39%)

Shell midden sites on in coastal landforms have been frequently registered. The artefact scatters with the study area tend to follow natural paths inland. This suggests movement to and from the coast, with people utilising land resources. This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016).

Other registered place types include LDADs (3.99%), object collection (1.52%), Aboriginal Ancestral Remains Burial (0.94%), quarry (0.12%) and stone features (0.12%)

2.3.3 Primary Traditional Owner Area – Shared Gunditjmara and Eastern Maar Aboriginal places

In this area, the two RAP groups overlap. The search of the Victorian Aboriginal Heritage Register (VAHR) identified 88 recorded Aboriginal places within the shared Gunditjmara and Eastern Maar RAP area. The dominant Aboriginal place types in the study area are shell middens (52.27%) artefact scatters (34.09%) and stone features (7.95%).

Majority of the artefact scatters and shell midden sites with the study area are located between the coast and Eumerella River. This suggests the use of both fresh and sea water sources for material and resources. Shell midden sites can be found along the coastline while the artefact scatters tend to be closer to fresh water sources. This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016).

Other registered place types include earth features (4.55%) and Aboriginal historic places (1.14%).

2.3.4 Secondary Traditional Owner Area - Wadawurrung Aboriginal places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 798 recorded Aboriginal places within the Wadawurrung RAP area. The predominate Aboriginal place types in the study area are artefact scatters (46.12%), shell middens (33.83%) and LDADs (9.27%).

Within the study area, artefact scatters tend to follow freshwater sources inland and cluster around headlands (such as the Queenscliff and the Indented Heads area). This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016), with groups using freshwater sources as occupation sites and opportunities for resource gathering, as well as using the headlands as vantage points across the bay or out to sea. LDADs are most often found further inland, compared to shell middens which are located closer to the shoreline. This suggests movement to and from the coast, as material is being discarded when people are moving across the landscape

Other registered place types include object collection (5.64%), earth features (2.88%), scarred trees (0.88%), Aboriginal Ancestral Remains Burial (0.75%) Aboriginal historic places (0.25%), stone features (0.25%) and quarry (0.13%)

Bellarine Aboriginal Places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 578 recorded Aboriginal places within the Bellarine Peninsula. The predominate Aboriginal place types found on the Bellarine Peninsula are artefacts scatters (48.44%), shell middens (29.41%) and LDADs (10.03%).

Within the study area, artefact scatters tend to follow freshwater sources inland and cluster around headlands (such as Queenscliff and Barwon Heads). This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016), with groups using freshwater sources as occupation sites and opportunities for resource gathering, as well as using the headlands as vantage points across the bay or out to sea. LDADs are most often found further inland, compared to shell middens which are located closer to the shoreline. This suggests movement to and from the coast, as material is being discarded when people are moving across the landscape

Other site types include object collection (6.75%), earth features (3.29%), Aboriginal Ancestral Remains Burial (0.87%), scarred trees (0.69%), Aboriginal historical places (0.35%) and stone features (0.17%).

2.3.5 Secondary Traditional Owner Area - Bunurong Aboriginal places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 1486 recorded Aboriginal places within the Bunurong RAP area. The predominate Aboriginal place types in the study area are shell middens (45.56%), artefact scatters (38.36%) and LDADs (8.28%).

Within the study area, artefact scatters on French Island and Phillip Island are found further inland, compared to shell middens. Some of the shell middens within the study area can be found in clusters around headlands (such as the Portsea and Sorrento area). This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016), with groups using freshwater sources as occupation sites and opportunities for resource gathering, as well as using the headlands as vantage points across the bay or out to sea.

Other registered place types include object collection (5.79%), earth features (1.28%), scarred trees (0.20%), Aboriginal Ancestral Remains Burial (0.20%), quarry (0.13%), Aboriginal historic place (0.07%), rock art (0.07%) and stone features (0.07%)

Mornington Peninsula and French Island Aboriginal Places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 813 recorded Aboriginal places within the Mornington Peninsula and French Island area. The dominant Aboriginal place types in the study area are shell middens (50.43%), artefact scatters (31.12%) and LDADs (11.69%).

Along the coast of the Mornington Peninsula there is a significant increase in shell midden sites from Sorrento to Cape Schanck. This could indicate targeted gathering of resources specific to this area and purposeful occupation of the coastline. From Cape Schanck, moving east, there is a noticeable decrease in the number of registered sites along the coast. Shell middens can be found along the coast, either along the shore or along creeks close to the coast (such as Merricks Creek). Artefact scatters can be found intermittently along the coast but can also be seen following water sources inland. This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016), with groups using freshwater sources and coastal sites as occupation sites and opportunities for variety in resource gathering. LDADs are an inland site type within the locality. This suggests movement to and from the coast, as material is being discarded when people are moving across the landscape.

There are 50 registered sites on French Island. Only nine of these sites are located along its coast, the other 41 are inland sites, with the majority of the sites being artefact scatters. The inland artefact scatters are located along paths of water, suggesting targeted use of the landscape (land use patterning).

Other registered place types include object collection (4.31%), earth features (1.72%), scarred trees (0.37%), Aboriginal historic places (0.12%), quarry (0.12%) and rock art (0.12%).

2.3.6 Secondary Traditional Owner Area - Gunaikurnai Aboriginal places

The search of the Victorian Aboriginal Heritage Register (VAHR) identified 700 recorded Aboriginal places within the Gunaikurnai RAP area. The predominate Aboriginal place types in the study area are shell middens (46.29%), artefact scatters (43.14%) and scarred trees (4.29%).

Clusters of artefact scatter sites can be found on the eastern coast of the Corner Inlet Marine and Coastal Park. These artefact scatters tend to follow sources of freshwater inland. This may indicate some form of land use patterning (Lawler, Oataway, & Berelov 2016), with groups using freshwater sources as occupation sites and opportunities for resource gathering, as well as using the headlands as vantage points across the bay or out to sea.

Other registered place types include LDADs (2.14%), Aboriginal Ancestral Remains Burial (2.14%), earth features (1%), object collection (0.57%), Aboriginal Ancestral Remains Reinternment (0.14%), Aboriginal historic places (0.14%) and stone features (0.14%).

Wilson's Promontory Aboriginal Places

The Traditional Owners of Wilson's Promontory come from two recognised RAP groups: Bunurong and Gunaikurnai.

The search of the Victorian Aboriginal Heritage Register (VAHR) identified recorded 384 Aboriginal places within the Wilson's Promontory area. The predominate Aboriginal place types in the study area are shell middens (72.40%), artefact scatters (21.61%) and earth features (2.08%)

Clusters of shell midden sites can be found both inland and around the coast of Wilson's Promontory. A large shell midden cluster can be found along the western coast of the Promontory with a total of 163 shell midden registered sites. Another two clusters have been recorded around the opening of Wilson's Promontory, with a total of 18 registered sites between them. All 18 shell midden sites are in close proximity to either the coast or moving water. Majority of the artefact scatter register sites recorded at Wilson's Promontory follow water sources inland. The strategic locations of both shell midden and artefact scatter sites demonstrate land use patterning.

Other registered place types include LDADs (1.56%), Aboriginal Ancestral Remains Burial (1.3%), object collection (0.52%), Aboriginal Ancestral Remains Reinternment (0.26%) and scarred trees (0.26%)

2.4 Aboriginal heritage – archaeological places in Tasmania

2.4.1 Primary Traditional Owner Area – Bass Strait Island Aboriginal places

Today, the Tasmanian Aboriginal people refer to sea country as tayaritja/Bass Strait Sea Country Protected Area (IPA) (TAC 2022). In recent works, the Marine Parks Project has been initiated to establish and recognise Aboriginal connection to the sea, as well as those areas of land now inundated after the rising sea levels after the last Ice Age. The South-east Marine Parks Network is located from Tasmania, Victoria and South Australia and includes:

- Underwater canyons and mountains;
- Diversity and abundance of marine creatures (unique globally to the study area);
- Rich diversity of marine mammals and birds (Aboriginal Education Tasmania 2022)

Tayaritja Sea Country IPA is managed by the Tasmanian Aboriginal Centre (DCCEEW 2022). These include Ramsar wetland as well as ecologically significant coastal habitats. The program will assist the Tasmanian Aboriginal Centre, and the broader Tasmanian Aboriginal Community with the rehabilitation, restoration and monitoring of the significant marine ecosystem (DCCEEW 2022). This will also aim to protect threatened marine animals and seabird life, including over 120 plant species (DCCEEW 2022).

Mackay (1946) was the first to identify archaeological evidence of past Aboriginal use of the Bass Strait Islands in the 1930s (see also (Sim 1990). Earlier thoughts were that these were stone artefacts left behind when the Tasmanians were moved to Flinders Island by George Augustus Robinson in the 1830s. It was not until Rhys Jones' work in the 1960s that attention to the Bass Strait islands was made. Sandra Bowdler (1979) excavated at Cave Bay Cave on Hunter Island that provided the first evidence of Pleistocene occupation, dating from 23,000 years. At this time, this was the oldest recorded date of Aboriginal occupation in Tasmania. This was also archaeological proof of the Bassian Land Bridge that once connected Tasmania to Mainland Australia (Sim 1990).

Further work was carried out on Flinders Island and several other smaller islands in Bass Strait showed signs of earlier occupation, including stone artefacts, middens and burials. It was believed at the time that the absence of middens on some islands, but the presence of stone artefacts meant that the midden sites were once closer to the original pre-Ice Age coast, which is now under water (Orchiston & Glenie 1978). The first middens excavated in Bass Strait was by Orchistone (Orchiston & Glenie 1978, Orchiston 1979, Orchiston

1984), however, the full details of the report have not been published. (Sim 1990) recorded a number of middens on Flinders Island in 1989 and noted that many of the remaining midden sites were found where the sea floor drops away abruptly, further suggesting that many of the midden sites were possibly found on ground level now under water due to rising waters after the Ice Age. (Sim 1990) argued that the Bass Strait islands were abandoned before the last remnants of the Bassian Plain land bridge between Mainland Australia and Tasmania disappeared. Davidson and Roberts Davidson & Roberts (2008:20) state:

For a while, perhaps, it was possible to use watercraft to maintain contact with families and friends on the other side but eventually this became more difficult. Boats sank sometimes, or storms and rough seas would have made the crossing perilous. When the sea barrier became too wide, those left on the Tasmanian side turned their backs and never saw their friends and families again. It proved to be a monumental turning point, leading to an independent evolution in their technology, economy, society and culture. They were alone for five hundred generations, knowing no other people in the world, living with the knowledge and beliefs derived from those they had known before the sea surrounded them. They remained isolated from the rest of humanity until that same sea brought the first Europeans in the late seventeenth and early eighteenth centuries

Brown (1990) conducted excavations on Flinders Island that again proved the antiquity of the Bass Strait Islands, where sporadic occupation from 20,000 years to 8,500 years was found at Mannalargenna Cave on Prime Seal Island. Again, it was hypothesised that the islands were abandoned after 8,500 years due to the rising sea levels (see Sim 1990). Early thoughts at the time state that water craft between the islands would have been possible, and the sea level rise was gradual and would have been shallower. However, with the rise of waters, also meant that the distance between land masses increased, therefore making travel much harder and dangerous. It is thus why many believe that the islands were abandoned around 6,000 years ago when the seas reached their current levels (Sim 1990).

The flooding of the Bassian Plain meant that the people who chose to remain in Tasmania would soon be isolated for generations. Jones (1971) states '... no other human society, which survived until modern times, had been isolated so completely and for so long'.

2.4.2 Secondary Area – Tasmanian coastal Aboriginal places

Archaeological evidence of occupation in Tasmania range between 34,000 – 40,000 BP. The most accurate date for occupation is from the Parmerspar Rockshelter close to Cradle Mountain that was excavated by archaeologist Richard Cosgrove (Mulvaney & Kamminga 1999, p. 189). This was a time when Tasmania was still a part of the landmass of Australia before it was disconnected with the flooding of the Bassian Plain after the last Ice Age. Further excavations of Kutukina Cave (formally Frasier Cave) in southwest Tasmania established Pleistocene settlement of Tasmania with radio carbon dates ranging from 15,000 to 20,000 years BP (Kiernan, Jones, & Ranson 1983, Mulvaney & Kamminga 1999, p. 182).

By the end of the last Ice Age (12,000 BP) the rising temperatures and subsequent rising sea levels flooded the Bassian Plain and separated Tasmania from the mainland of Australia (Kee 1987, p. 12; Taylor 2003). The formation of what is now known at the Bass Strait ultimately led to the isolation of the Tasmanians from their groups on the mainland of Australia. The resulting 10,000 years of isolation crafted a unique culture and economy that was independent from any mainland Australia influence (Mulvaney & Kamminga 1999, p. 339). A series of environmental and climatic changes started to occur in Tasmania as a result of this separation with a reduction in rainfall, lower than normal temperatures, some reduction in the seeding of vegetation, as well as the formation of sand dune systems that were to become a prime area for the discovery of Aboriginal remains. Kee (1987, p. 14) stated that these dunes formulated a new abundance of resources available to the Tasmanian's, which is reflected in much of the early archaeology of this period. These climatic changes started to stabilise around 6,000 years ago. This has been noted by radiocarbon dating at Carlton Bluff, where dates ranged from 8,000 to 6,000 BP (Dix 2015, pp. 147–8); Kee 1987, p. 12;

Neil 1981; Reber 1965), and therefore the range of sites found on the coast are more than likely representative of this 6,000 year figure.

Regionally, sites vary in Tasmania. As such, the state has been divided into three geographic regions. Various studies were conducted in the 1980s and 1990s to understand these regional differences in sites, and to understand more broadly Tasmanian Aboriginal archaeology (Brown 1991; Cane 1980; Cosgrove 1985; 1990; Gaughwin 1985: 52; Jones 1965; 1966; 1967; Key 1991; Lourandos 1968; 1970; 1977; MacFarlane 1993; Stockton 1977a, 1977b; 1982).

- East/South East Tasmania
 - Middens formulate 90% of all site types on the east coast with a range of shell from turbo, oyster, limpet, abalone and mussel. Brown (1991:46) determined that turbo middens dominated areas behind rock platforms where oysters were mostly predominant behind sandy beaches, where shell fish consumption generally took place within the immediate proximity of where it was procured from;
 - 50m within the coastline appears to be the limit of the majority of the larger sites in the area;
 - Sites are generally situated on well drained more inland areas;
 - That 81% of sites recorded contained some level of stone artefacts, and generally consist of hornfels, cert, quartzite and chalcedony flakes.
 - Stone artefact scatters were generally located on flat or gently inclined landscapes where they were close to a water source;
 - The underlying geology of the inland area suggests that areas where the underlying rock was sandstone was more favourable over those areas that contain dolerite;
 - Sandstone rock shelters located close to water often contain signs of occupation.
 - Rock art can occasionally be found on sandstone rock shelters, and is generally executed in ochre.
- Archaeological Sites – North/ North East Tasmania
 - Sites generally occur on high energy coastlines;
 - Approximately 78% of sites occur within 50m from a water source;
 - Sand dune areas most commonly have sites located on them;
 - The main stone typology noted in these assemblages include hornfels, chert, and quartz.
 - Rock art can be found pecked in stone on coastal margins
- Archaeological sites North West/ West/ South West
 - Majority of sites can be found on sand dunes close to rock platforms;
 - Middens are generally smaller and lower on sandy shores.
 - Middens are generally absent along rocky granite shorelines.
 - Site types include artefact scatters, isolated artefacts, stone and ochre quarry sites and rock shelters.

- The main stone types used in the area include spongolite, quartzite, quartz, silcrete and hornfels.
- Artefact scatters and isolated artefacts are generally located on the forest plain.
- Stone artefacts will be varies in material type, which reflects the opportunistic nature of collecting material.
- Areas within 500m of major water courses and creeks will generally contain Aboriginal sites.
- Sites that contain stone artefacts made from spongolite artefacts will no predate 2,500BP.
- Generally, sites are 70 to 100 artefacts per km². Densities are approximately 1.7 artefacts per site in places away from major rivers and quarry sites, whereas there will be approximately 6.5 artefacts per site in areas close to these resources.
- Sites will generally be located near the transition of inland heath plains and forest margins.
- Large artefact scatters will be located close to major creeks or rivers especially where flat grounds are associated with the area;
- Hut depression occur on coastal margins, generally close to food sources
- Rock art is found on coastal margins, and is generally pecked or engraved on large sandstone faces, or where creeks exit to the sea.

2.5 Archaeological summary

Within the study area, along the Victorian coast, there are 5636 registered Aboriginal places with the most common site types being shell middens, artefact scatters and LDADs. Shell middens are typically found along the coastline, whereas artefact scatters, while also being found along the coast, are varied and move inland following freshwater sources, likely to be indicative of past inland-coastal travel routes. LDADs are also typically found further inland than shell middens and artefact scatters, indicative of widespread use of the landscape in the past, rather than concentrations and repeated patterning.

In light of a review of Aboriginal places within the study area, there is a high likelihood for Aboriginal cultural heritage material to be present within the areas subject to potential impact.

Within Tasmania, Aboriginal heritage should be expected in any area of low-lying coastal areas, shelter sites, and sources of food, water and raw materials. These coastal margins contain all Tasmanian Aboriginal site types. It is also known on the West Coast of Tasmania, that a number of rock art sites are located on the coast, many either close or in tidal margins (Dix pers. obs.). Large midden sites are also located very close to the waters edge, as well as some stone quarry sites within tidal margins (Dix pers .obs.). It has also been observed that there is evidence some submerged sites within areas of Tasmania, and these will need to be considered (Dix pers.obs.)

2.6 Traditional Owner groups and ethnohistory

For the purposes of this assessment, information about Aboriginal Victorian and Tasmanian pre and post contact history has been sourced from nineteenth and twentieth century primary and secondary ethnographic/historical records.

2.6.1 Primary Traditional Owner Area - Gunditjmarra

The Gunditjmarra RAP group covers the area boarding the South Australia border with Victoria and the Southern Grampians. This area includes Harrow and Horsham, south to Dunkeld and MacArthur, and southwest to Portland and Cape Nelson. The Gunditjmarra RAP area also includes many state and national parks such as Discovery Coastal Park, Mount Richmond National Park, Cape Nelson State Park and the Grampians National Park.

The area between the Shaw and Eumerella Rivers in the south-west to Lake Linlithgow in the north and Yambuk in the south, are shared by both the Gunditjmarra RAP and the Eastern Maar RAP groups.

There are many landscapes within Gunditjmarra Country – Nyamat Mirring (Sea Country), Tungatt Mirring (Stone Country), Bocara Mirring (River Country) and Woorrowarook Mirring (Forest Country) (Glenelg-Hopkins Catchment Management Authority 2023).

It can be noted that the Gunditjmarra view water as part of their traditional lands and should be recognised and protected as such (Clark 1990, RNTBC 2023)

Evidence of Gunditj Mara knowledge of water is found in the eel trapping and the redirecting of waterways at Lake Condah and in the larger Budj Bim National Heritage Landscape. The Budj Bim National Heritage Landscape had been managed by Traditional Owners to form waterways and channels to bring eels down from Darlots Creek into Lake Condah for fishing and resource gathering (Department of Climate Change, Energy, the Environment and Water 2021). This practice can be dated to approximately 6600 years old, with one of five of the eel trap systems around the lake's edge being carbon dated. The relocating and breeding of eels became a sustainable husbandry practice that sustained the Gunditjmarra through every season, providing food stuffs and sources of trade. There are plans currently being made with VicWater and Wannon Water to reestablish traditional eel farming in the Budj Bim area (VicWater 2022). Another plan devised to aid in the management of Indigenous water landscapes is the Sea Country IPA Program. The Sea Country IPA (Indigenous Protected Areas) Program was developed at the beginning of 2021 to aid in the conservation and protection of Indigenous marine and coastal environments. The IPA program covers the Gunditjmarra area from the Convincing Ground to the Yambuk Lakes and provides further protection of the Budj Bim landscape as well as opportunities for Indigenous employment, documentation of traditional knowledge and sea management (DCCEEW 2022)

The Lake Condah mission was opened in 1867 in response to the displaced Gunditj Mara after the Eumerella wars (Budj Bim Cultural Landscape 2023). The Eumerella wars lasted over 20 years, beginning in the mid 1830s to the 1860s, starting over disagreements in ownership of land in southwest Victoria. The Dhauwurd wurrung people (apart of Eastern Maar country) refused to settle at the mission in Framlingham, so the Lake Condah mission was established, where they farmed and learnt to read and write English. The mission was strategically positioned to both house eel trapping facilities and have a view of the Budj Bim Reserve. In 1918, the mission was formally closed, and some of the Gunditj Mara were moved to other missions, such as the Lake Tyers Mission, while others refused to leave country. In 1987, the land on which the mission was situated on was given back to the Gunditj Mara (Budj Bim Cultural Landscape 2023).

Gunditj Mara hold strong cultural connections to sea country (Nyamat Mirring), and Nyamat Mirring features heavily in the Dreaming and creation stories of the Gunditj Mara. The Gunditj Mara believe that after the initial eruption of the creator spirit, Budj Bim, out of a volcano, the spirits movement throughout the landscape created the surrounding landscapes and their features. The lava flow from this

eruption caused the creation of the wetlands found within the Gunditj Mara landscape. In the traditional funeral rites of the Gunditj Mara people, bodies are bundled in grass and laid into the ground with their heads pointing towards Deen Maar (Lady Julia Percy Island). This is due to Deen Maar having a cave called Tarn Wirrung, which is thought to be the beginning of the passage towards the afterlife. Once the bodies were buried, if grass grew at the mouth of the cave, it was thought that the spirit had made it to the island, and into the realm of the clouds

Deen Maar (Lady Julia Percy Island) is the point where two creator deities, Punjil and Pallian left this earth. Pallian was the creator deity of the sea and fish and the governor of the oceans (after William Thomas, Letters from Victorian Pioneers, in National Oceans Office 2003:12). This island holds and creation story holds significance for both the Gunditjmarra and Eastern Maar.

Significant locations of conflict are also located on the coast, including the massacre of Gunditj Mara at Convincing Ground, east of Portland. The Convincing Ground Massacre occurred at Allestree, approximately 10km from Portland, where Kilcarer Gundidj, Gunditj Mara people were killed by whalers over a disagreement about the ownership of a beached whale (VHR n.d.). The suggested dates for this massacre are between 1833 and 1834, with an unknown number of Indigenous peoples being killed (VHR n.d.).

2.6.2 Primary Traditional Owner Area - Eastern Maar

The Eastern Maar RAP group covers the area including Port Fairy and Warrnambool, down to Apollo Bay, east to Lorne and northwest towards Ararat. The RAP area of Eastern Maar also extends 100 meters off the coast and therefore encompasses the Twelve Apostles.

Eastern Maar is an umbrella term, used to describe a large area of land containing many, smaller traditional owner groups, such as Maar, Eastern Gunditjmarra, Tjap Wurrung, Peek Whurrung, Kirraw Whurrung, Kuurn Kopan Noot, Yarro waetch and many others. (Eastern Maar Aboriginal Corporation 2020)

In 1865 the first Aboriginal mission was formed in the Western District at Framlingham in Girai wurrung country, north-east of Warrnambool. Aside from the Dhauwurd wurrung clans who moved to the Lake Condah mission in the 1860s, other Indigenous people were removed to the Framlingham Aboriginal Mission, which was gazetted as a 'temporary reservation for the use of Aborigines' (Barwick 1979: 4). In this mission the Eastern Maar people continued both cultural and spiritual traditional practices. In 1867 and 1899 the mission was meant to close down, and the Eastern Maar people were expected to move into the Lake Condah mission. Again, in 1916, the Eastern Maar people were expected to move into missions within Gippsland Victoria. All three times, the people refused to move and were successful in staying on country. During the 1970's, Eastern Maar were granted ownership of the land, including 586 acres of the original mission (Lawler, Oatway, & Berelov 2016).

Eastern Maar's connection to water relies heavily in the marine resources, abundant around the area. Fishing practices are still used today with the fishing and collection of eels, perch, blackfish, yabbies, abalone, cockles and crayfish (Eastern Maar Aboriginal Corporation 2015, p. 9). The techniques used in eeling have been passed down for generations, meaning the practices used today are techniques and skills traditional owners were using to eat and to trade (Eastern Maar Aboriginal Corporation 2015, p. 9). Shell middens are an important archaeological site to the Eastern Maar, where they take time to teach others about the importance of culture and preservation and management of sea resources (Eastern Maar Aboriginal Corporation 2015, p. 9).

When Maar citizens visit places with archaeological sites, we take time to teach our young ones about what they mean in terms of our history and culture. For example, our ancestors left many ancient middens along the coast which continue to tell a story about our Country - how the coastline and estuaries fluctuated, how and when our ancestors used the resources along the coast, what was harvested from out in the open ocean, how climatic conditions changed over time, where the meeting places were and ceremonies took place. This type of cultural

learning helps develop empathy for Country; a deeper understanding on a societal scale of what Country means to us as a nation. We always pay our respects...(Eastern Maar Aboriginal Corporation 2015, p. 9)

Through Country, Eastern Maar People connect with their ancestors who are associated with different water systems within the landscape (Eastern Maar Aboriginal Corporation 2015, p. 9):

We believe that the spirits of our dead reside in our waterways and water bodies, and that they use animate and inanimate objects to move through Country. The signs they reveal to us are an important part of the interaction with our Ancestors – engaging, guiding, informing and warning us. When our citizens die, they are often buried with their bodies facing towards Deen Maar (Island). A story associated with Deen Maar Island is that the spirits go first to Deen Maar and then up to the stars, as Bunjil had done. A star falling or lights flying through the sky is a sign that the spirit is going over.

Sea Country Maar citizens have always had a close connection with the sea and its resources, which were central to our culture, economy and survival. The ocean nourished our Ancestors and we still rely on it for our survival. Abundant middens along the coastline tell a rich story of our past. The coastline is home to sites that are important for our Dreaming - Three Sisters Rocks and Deen Maar (Lady Julia Percy Island) where our Ancestors leave the earth. Our connection with our Sea Country extends well beyond the current shoreline to the edge of the continental shelf. While this area is under the sea today, we occupied it for thousands of years and rising sea levels have not washed away the history, physical evidence or our connection.(Eastern Maar Aboriginal Corporation 2015, p. 13)

2.6.3 Secondary Traditional Owner Area - Wadawurrung

Aboriginal groups mapped natural features as boundaries for their ranges, estates and economic territories. The Wadawurrung held land along the coast from Painkalac Creek at Aireys Inlet, east into Port Phillip Bay and to the Werribee River and to the north as far as Mt Emu and Fiery Creeks (Clark 1990).

Little is known about the Wadawurrung and their social organisation as they were one of the first Aboriginal groups within the region to be affected by European settlement in the area (Clark 1990). However, the Wadawurrung RAP organisation has traced its people's lineage to that of the seven families of John Robinson who was born in 1846 and passed in 1919 (WTOAC 2019).

During the summertime months, Wadawurrung along with Djab wurrung, Dhauwurd wurrung and girai wurrung language groups gathered at Mirraewuae swamp for ceremony and hunting. In early autumn the *Wada wurrung* would meet with Girai wurrung at Lake Bolac with local Djab wurrung named groups to take advantage of the migratory eels. The Wadawurrung participated in trade meetings at Terang, trading axe's and adhesive gum.

The coastal Wadawurrung first came into contact with settlers around the early 1800s when John Murray and William Flinders surveyed part of Indented Head. By the end of 1836 sheep runs were endemic around Geelong for an approximate 40.2 kilometre radius. The following year, settlers began to spread westward towards the Colac district.

An important figure in the history of Wadawurrung country was an escaped convict named William Buckley. The Wadawurrung balug first encountered Europeans in 1832 when William Buckley, escaped from the failed Sorrento settlement in 1803. Buckley was adopted by the Wadawurrung balug and spent the next 32 years with them; taking part in their customs, learning the language as well as hunting gathering techniques (Clark 1990). Buckley's story was recorded by John Morgan in 1852. From Buckley's accounts it was recorded that the Wadawurrung balug would catch eels at Lake Modewarre and would spend time on the hunting ground of the neighbouring Bengalat bulluck. According to Buckley the clan was at odds with the Bun wurrung, Woi wurrung and Daung wurrung clans (Clark 1990).

2.6.4 Secondary Traditional Owner Nations Area - Bunurong

The land encompassing the eastern side of the study area, as mapped by Clark (Clark 1990), is held by the Boon Wurrung language group, commonly associated with the Bunurong people. Boon Wurrung land occupied the coastal area from the Werribee River to Anderson Inlet, Phillip Island and probably beyond to Wilsons Promontory (Horton & Morris 1983, p. 44). The Bunurong RAP group covers the Mornington Peninsula (such as Rosebud and Frankston), Western Port (French Island, Phillip Island and San Remo) and the eastern most part of South Gippsland (Warragul down to Leongatha)(BLCAC 2023).

The Bunurong group is loosely divided into smaller clan or family groups, named for the area they associated with (Gaughwin & Sullivan 1984, p. 85). Barwick (1984, pp. 117–118) identified six clans: the *Burinyung-balluk* from Point Nepean and Cape Schanck, the *Mayone-bulluk* associated with the Carrum swamp, Cranbourne and the northern part of the Mornington Peninsula, the *Ngaruk-willam* associated with the Brighton area and Mordialloc, the *Yallock-bulluk* (most relevant to the study area) associated with the eastern side of Bass River and Tooradin, the *Yallukit-willam* associated with the area now called St Kilda and a broader region from the Werribee River to Mordialloc, the *Yowengherra* occupying the Tarwin River area. Thomas distinguished between the Bunurong people from Port Phillip and those of Western Port, though he rarely had contact with the Bunurong people on the eastern side of Western Port Bay (Sullivan 1981, pp. 16–9, Clark 1990). The Yallock-Bulluk Bunurong group are the most likely to have lived and associated with San Remo and Phillip Island area. The moiety of the Yallock-Bulluk named group is Bunjil, commonly associated with the Phillip Island area.

People were likely to have moved between the interior in winter and the coast in the summer. Movement was made up of many small distances (c. 10 km per day) punctuated by camps of one to three nights and occasionally longer stays of eight to ten days (Sullivan 1981). Social activity involving neighbouring named or socio-dialectical groups was usually held in warmer periods, held at the intersection of group boundary's and arranged by a person assigned of the responsibility of travelling between groups to organise the time, place, and events of the meeting.

An important figure in the history of Bunurong country was an Indigenous man named Derrimut. Derrimut was the *arweet* the *Yalukit Willam* group at the time of European settlement of the region (Clark 1990, pp. 368–9). His name, Derrimut (derrimart/derremot), is believed to mean 'to hunt' or 'to pursue' in the language of the *Yalukit Willam* (Clark 2005, p. 1), Derrimut was a prominent figure in both the Indigenous and European histories of early Melbourne, and historical and contemporary views of his status vary. William Buckley, an escaped convict who lived with the Wadawurrung people of the Geelong region, considered him a 'traitor' who should be speared for divulging impending attacks to European colonists (Clark 2005, pp. 109). Clark (2005) considers Derrimut a 'culture-broker' who sought to navigate the newly imposed political context of colonial Victoria by forging relationships with prominent early European Melbournians including John Pascoe Fawkner and William Thomas, who held Derrimut in high regard (Clark 2005, pp. 111). In 1849, Derrimut and other members of the *Yalukit-Willam* agitated for the establishment of the Mordialloc Reserve, and when it was later divided for sale in 1863, Derrimut used his European connections to angrily protest its sale (Clark 2005, pp. 116).

Bunurongs use of water-based resources is evident in the quantity of shell midden sites found along the coastline. Within the study area and the bounds of the Bunurong RAP group, there are a total of 677 registered shell midden sites, within two hundred meters of the shoreline. This suggests knowledgeable exploitation of marine resources as practiced techniques and an understanding of the ocean would be needed to accumulate the amount of shell middens listed on Bunurong country.

2.6.5 Secondary Traditional Owner Area - Gunaikurnai

The Gunaikurnai RAP group covers most of the Gippsland Area, spanning from Warragul and Noojee, down to Port Albert and Port Welshpool, eastward towards Bairnsdale, Lakes Entrance and Marlo, and north towards Omeo and Hotham Heights

The Gunaikurnai believe in strong connections between land (Wurruk), water (Yarnda) and air (Watpootjan) and how these connections support living things. The Gunaikurnai see no separation of land and water, combining the two to represent whole country and therefore, demonstrate the same levels of importance to both land and sea. Due to this definition of country, both land and ocean receive the same amount of protection and management (GLWAC 2023a).

Throughout Gunaikurnai country, there are multiple sites that detail Indigenous relation to country and resource exploitation. One site that displays local resource exploitation is the recently excavated cave near Mitchell River, Raymond Creek 2 Rock Shelter, that provides evidence of using mussel shell tools and localised resource gathered through fishing (Monash University & GLWAC 2019).

The Buchan Caves Reserve is an example of the spiritual and physical relation to country that the Gunaikurnai people share. At this site in Eastern Victoria there are registered indigenous burials located in and around the cave system, creating a spiritual space within the landscape. In conjunction to the sacred burials, the site was already known to be a great place of connection as it played an integral role in the migrating patterns of the Gunaikurnai travelling through the mountains (GLWAC 2023b).

The area surrounding Buchan Caves Reserve is also considered special to country, with several other caves being recognized as having cultural meaning. One such cave is Cloggs Cave, located southeast of Buchan Caves Reserve, having an undisturbed cultural sequence, that could prove indigenous settlement in the Late Holocene and holds evidence of megafauna that challenge the idea of megafaunal extinction being caused by the LGM (GLWAC 2023a, David et al. 2021, GLWAC 2023b)

2.6.6 Primary Traditional Owner Area – Palawa (Tasmania)

Prior to European colonisation, the Tasmanian landscape was delineated by socio-dialectical groups based around clan or family groups identified as owning areas of land, which formed larger amalgamations based on shared common language, economic and social interests. These larger amalgamations are referred to as Nations by early ethnographer George Robinson (see below).

During the winter months, groups would usually be located on their coastal home ranges targeting shellfish and waterfowl resources such as swans and swan eggs. During spring and summer the groups move further west inland, hunting game with targeted burns (Ryan, 2012, pp. 17-19). While some clans in resource rich areas would not always seasonally migrate, but take advantage of local resources all year round, they would however travel as required for ceremonial events in neighbouring clan and nation territory as required (Ryan, 2012).

According to Jones (1974), Tasmanian Aboriginal society pre colonisation consisted of three social units. These generally consisted of the hearth group, the band and the Tribe (Jones 1974; Ryan 2012). The hearth group was described as being the family unit, and consisted of a man, woman, any children, grandparents and aged family or relatives (Plomley 1983). It is believed that this group ranged from between two to eight people (Jones 1974; Plomley 1983).

There were nine individuals in this family, and clearly they represented a hearth group, because Peron visited their campsite with its single hut. The group comprised an older man and wife, a younger man and wife, and five children, one a daughter (Oure-Oure) of the older man and wife, and the other four the children of the younger man and wife. (Plomley 1983:168).

The band was considered to be more similar to a 'social unit'. This ranged from a number of hearth groups, that was defined by geographic boundaries (Jones 1974:324-325). Brown (1986:21) further notes that according from ethnographic reference from the period, the band was generally led by an older man who was know for their success as a hunter and fighter. Brown (1986:21) also believes that the band was exogamous, with the wife generally moving to her husband's band and hearth group. Each of these bands were then associated with what could be called a 'political' unit (Jones 1974:328-329):

...that agglomeration of bands which lived in contiguous regions, spoke the same language or dialect, shared the same cultural traits, usually intermarried, had a similar pattern of seasonal movement, habitually met together for economic and other reasons, the pattern of whose peaceful relations were within the agglomeration and of whose enmities and military adventures were directed outside it. Such a tribe had a territory, consisting of the sum of the land owned by its constituent bands ... The borders of a territory ranged from a sharp well defined line associated with a prominent geographic feature to a broad transition zone.

Ryan (2012:14) hypothesises that the population of Tasmania was associated with a broad network of nine Tribes, each consisting of six to 15 bands. Ryan (2012:14) estimates that at by the time of European colonisation, the population of each group was around 350 and 800 people, where the overall population of Tasmania is estimated at being 3000-8000 people.

The first European interactions within Tasmania occurred in 1642 when Abel Tasman stayed a short time at anchor near modern day Dunalley, and noted that people inhabited Tasmania, but never saw any of the Tasmanians (Plomley 1983:160). Marion du Fresne was to anchor for four days in Marion Bay on 1-10 March 1772, some one hundred and thirty years later (Plomley 1983:160). He is known to have visited the mainland shore close to the anchorage here, as well as Maria Island. Tobias Furneaux anchored in Adventure Bay from 10-15 March 1773, and later James Cook was there from 26-30 January 1777 and William Bligh on 20 August 1788 (Plomley 1983:160). John Henry Cox anchored in now Cox Bight and Oyster Bay between 3-11 July 1793. William Bligh made a second visit from 9-22 February 1792, and John Hayes was anchored in the Derwent from 26 April to 9 June 1793, however, records of this long visit no longer exist (Plomley 1983:160). George Bass and Matthew Flinders circumnavigated Tasmania between October 1798 and January 1799, where the last European visitation to Tasmania before colonisation at Risdon Cove in 1803 was that of the Baudin Expedition of 1802 (Plomley 1983:160).

Lieutenant John Bowen's occupation at Risdon Cove in 1803, which would have occurred in Moomairremener territory, represents the first permanent European settlement of Tasmania. This location lies in a key route between the Big River Nation's kangaroo hunting grounds to the northwest and rich shellfish grounds of the Oyster Bay Nation such as the study area and Coal River estuary to the west. The Risdon settlement soon encountered travelling bands of Big River and Oyster Bay Nation, with both Europeans and Tasmanian Aboriginal People being initially shocked at the arrival of each other. The initial European reaction was very hostile and soldiers fired upon Big River and Oyster Bay Nation people several times within the first five months of occupation, with the Risdon massacre of a group of Big River Nation people occurring on the 3 May 1804.

From 1807 to 1813, incoming settlers from Norfolk Island began to settle the southeast coast which led to direct confrontation with the Oyster Bay Nation (Ryan, 2012, p. 62). Early European settlement in Tasmania struggled with reliable food supplies and Europeans were often in direct competition with Aboriginal hunters for kangaroo and emu meat. By 1818 the Moomairremener clan had suffered heavily from conflict with Europeans and survivors either moved to other Oyster Bay or Big River clans to continue resistance, or tried to remain on their familiar territories with some reliance on charitable assistance from European settlers. Conflict continued to escalate between 1823 and 1828 before Aboriginal resistance in the 'settled areas' was quashed around 1830 with the surrender of Mannalargenna, a key Oyster Bay chief and resistance fighter (Ryan, 2012). Twenty three Oyster Bay and Big River survivors of the conflict would eventually follow Robinson to Flinders Island.

With the removal of the Tasmanians to Flinders Island by George Augustus Robinson after the ill-fated Black Line military operations in the state, population of the Tasmanian Aboriginal people decreases, and associations with different geographical areas of Tasmania were lost. When the Tasmanian Aboriginal people returned to the mainland to Oyster Cove, many of these survivors were not allowed back into their traditional areas where they were born, or where their family had resided for generations.

Today, coastal sites generally consist of midden sites, however, significant stone quarries, rock art, and former hut depressions and camp site can still be located. These sites show a seasonal exploitation of the coastal areas (Brown 1991; Jones 1977). The recording of bark canoes by early explorers shows that the Tasmanians did have a rich maritime tradition, however, many of these were used to access smaller off shore islands, not the larger islands of Bass Strait, or to the main land of Australia (Jones 1977).

2.7 Conclusion

Aboriginal communities in Victoria and Tasmania continue to be present and vibrant, and maintain strong connections to their traditional lands, waters, and their cultures. Each group is distinct and hold different systems of belief, connection, ceremony, language and lore and cultural practice. Each group hold traditional ecological knowledge of plants, animals and land management passed down through generations.

Aboriginal communities continue to practice traditional hunting, fishing, and gathering, and have a deep understanding of the environment around them. They also have a spiritual connection to the land and sea. Aboriginal people and representative bodies in Victoria and Tasmania have become more active in conservation, land and heritage management, working to protect and restore their traditional lands and waters, and to ensure that their cultural heritage is respected and protected.

Coastal environments in south-eastern Australia are rich in cultural sites. These include archaeological sites, such as shell middens and stone quarries, as well as "natural" sites, such as headlands, river mouths, reefs and islands. These sites have continuing cultural meaning because of their connection with Creation Stories, Dreaming Tracks, ceremonial places, camping places and massacre sites. Many of these places are listed on the Register of the National Estate, others are recorded in State-based heritage registers, while many others are known only to Indigenous people themselves and are not formally recorded...

Protecting this cultural heritage is a major concern for Indigenous people. (National Oceans Office 2002:4).

This Cultural Heritage Desktop Assessment explores the cultural heritage background for the region, provides a summary of available information in order to provide the project with a grounding in the cultural heritage of Aboriginal people in the study area.

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4 Glossary of Terms

The glossary provides definitions of various archaeological and heritage related terms.

Heritage place: A place that has aesthetic, historic, scientific or social values for past, present or future generations – ‘...this definition encompasses all cultural places with any potential present or future value as defined above’ (Pearson & Sullivan, 1995, p. 7).

Aboriginal place: Aboriginal place is defined under Section 5 of the *Aboriginal Heritage Act* 2006 as follows:

5 What is an Aboriginal place?

(1) For the purposes of this Act, an Aboriginal place is an area in Victoria or the coastal waters of Victoria that is of cultural heritage significance to the Aboriginal people of Victoria.

(2) For the purposes of subsection (1), *area* includes any one or more of the following—

- (a) an area of land;
- (b) an expanse of water;
- (c) a natural feature, formation or landscape;
- (d) an archaeological place, feature or deposit;
- (e) the area immediately surrounding anything referred to in paragraphs (c) and (d), to the extent that it cannot be separated from the thing without diminishing or destroying the cultural heritage significance attached to the thing by Aboriginal people;
- (f) land set aside for the purpose of enabling Aboriginal human remains to be re-interred or otherwise deposited on a permanent basis;
- (g) a building or structure.

Alluvial terrace: a platform created from deposits of alluvial material along river banks.

Angular fragment: a piece of stone that is blocky or angular, not flake-like.

Archaeology: the study of the remains of past human activity.

Artefact scatter: a surface scatter of cultural material. Aboriginal artefact scatters are defined as being the occurrence of five or more items of cultural material within an area of about 100 square metres. Artefact scatters are often the only physical remains of places where people have lived camped, prepared and eaten meals and worked.

Backed piece: a flake or blade that has been abruptly retouched along one or more margins opposite an acute (sharp) edge. Backed pieces include backed blades and geometric microliths. They are thought to have been hafted onto wooden handles to produce composite cutting tools. Backed pieces are a feature of the ‘Australian small tool tradition’, dating from between 5,000 and 1,000 BP in southern Australia (Holdaway & Stern, 2004).

Blade: a flake at least twice as long as it is wide.

Burial place: usually a sub-surface pit containing human remains and sometimes associated artefacts.

Contact place: see ‘Aboriginal historical archaeological place’.

Core: an artefact from which flakes have been detached using a hammerstone. Core types include single platform, multi-platform and bipolar forms.

Cortex: original or natural (unflaked) surface of a stone.

Cortical: refers to the cortex.

Flake: a stone piece removed from a core by percussion (striking it) or pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

Flaked piece: a piece of stone with definite flake surfaces, which cannot be classified as a flake or core.

Formal tool: an artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces and axes.

Geocentric Datum of Australia 1994 (GDA94): a system of latitudes and longitudes, or east and north coordinates, centred at the centre of the earth's mass. GDA94 is compatible with modern positioning techniques such as the Global Positioning System (GPS). It supersedes older coordinate systems (AGD66, AGD84). GDA94 is based on a global framework, the IERS Terrestrial Reference Frame (ITRF), but is fixed to a number of reference points in Australia. GDA94 is the Victorian Government Standard and spatial coordinates for excavations, transects and places in CHMP documents.

Geometric microlith: a small tool that has been fashioned from breaking apart a microblade. The piece is then retouched or backed and a small tool formed.

Grindstones: upper (handstone) and lower (basal) stones used to grind plants for food and medicine and/or ochre for painting. A handstone sometimes doubles as a hammerstone and/or anvil.

Hearth: usually a sub-surface feature found eroding from a river or creek bank or a sand dune - it indicates a place where Aboriginal people cooked food. The remains of a hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved within a hearth.

Isolated artefact: the occurrence of less than five items of cultural material within an area of about 100 square metres. It/they can be evidence of a short-lived (or one-off) activity location, the result of an artefact being lost or discarded during travel, or evidence of an artefact scatter that is otherwise obscured by poor ground visibility.

Manuport: foreign fragment, chunk or lump of stone that shows no clear signs of flaking but is out of geological context and must have been transported to the place by people.

Map Grid of Australia (MGA): The official coordinate projection for use with the Geocentric Datum of Australia 1994 (GDA94).

Mound: these places, often appearing as raised areas of darker soil, are found most commonly in the volcanic plains of western Victoria or on higher ground near bodies of water. The majority were probably formed by a slow build-up of debris resulting from earth-oven cooking; although some may have been formed by the collapse of sod or turf structures.

Percussion: the act of hitting a core with a hammerstone to strike off flakes.

Platform preparation: removal of small flake scars on the dorsal edge of a flake, opposite the bulb of percussion. These overhang removal scars are produced to prevent a platform from shattering.

Pre-contact: before contact with non-Aboriginal people.

Post-contact: after contact with non-Aboriginal people.

Quarry (stone/ochre source): a place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

Rejuvenation flake: a flake that has been knapped from a core solely for the purpose of preparing a new platform and making it easier to get flakes off a core, as it reduces the angle between platform and core surface.

Retouch: a flake, flaked piece or core with intentional secondary flaking along one or more edges.

Rock art: 'paintings, engravings and shallow relief work on natural rock surfaces' (Rosenfeld, 1988, p. 1). Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface. Rock engravings were made by incising, pounding, pecking or chiselling a design into a rock surface. Rare examples of carved trees occasionally survive.

Rock shelter: may contain the physical remains of camping places where people prepared meals, flaked stone, etc. They are often classed as a different type of place due to their fixed boundaries and greater likelihood of containing sub-surface deposits. Rock shelters may also contain rock art.

Scarred tree: scars on trees may be the result of removal of strips of bark by Aboriginal people e.g. for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide hand and toe holds for hunting possums and koalas. Some scars may be the result of non-Aboriginal activity, such as surveyors' marks.

Scraper: a flake, flaked piece or core with systematic retouch on one or more margins.

Shell midden: a surface scatter and/or deposit comprised mainly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These place types are normally found in association with coastlines, rivers, creeks and swamps – wherever coastal, riverine or estuarine shellfish resources were accessed and exploited.

Significance: the importance of a heritage place or place for aesthetic, historic, scientific or social values for past, present or future generations.

Striking platform: the surface of a core, which is struck by a hammerstone to remove flakes.

Structures (Aboriginal): can refer to a number of different place types, grouped here only because of their relative rarity and their status as built structures. Most structures tend to be made of locally available rock, such as rock arrangements (ceremonial and domestic), fishtraps, dams and cairns, or of earth, such as mounds or some fishtraps.

Stratified deposit: material that has been laid down, over time, in distinguishable layers.

Transect: A fixed path along which one records archaeological remains.

Utilised artefact: a flake, flaked piece or core that has irregular small flake scarring along one or more margins that does not represent platform preparation.

5 Appendix A – Aboriginal Cultural Heritage Search Results

Tables of results to be included.

EXTENT



OTWAY EXPLORATION DRILLING

ABORIGINAL CULTURAL HERITAGE ADDENDUM REPORT

Prepared by Extent Heritage for ConocoPhillips Australia

14 October 2024 — FINAL



SYDNEY

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HERITAGE**



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Please note: This report contains pictures of and information about people who may have passed away.

EXECUTIVE SUMMARY

ConocoPhillips Australia is proposing to undertake resource exploration activities in Commonwealth waters off the Otway Basin, Victoria. While ConocoPhillips Australia, as titleholder, has the exclusive right to undertake activities within the offshore area of their title, the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (the Environment Regulations) require that an accepted Environment Plan (EP) be in force before commencing any such activities.

An EP has been developed, including a suite of environmental assessments across the wider region (ConocoPhillips 2024). The EP required an Aboriginal Heritage Assessment of the wide offshore area, which was completed by Biosis in 2023 (Biosis 2023). This assessment covered the complete low threshold Environment that May Be Affected (EMBA), which spans the entire Victorian coastline, and portions of the Tasmanian, South Australian and New South Wales coastlines.

The assessment included background environmental research, ethnohistorical research and a search of the Victoria Aboriginal Heritage Register (VAHR). Following its inclusion in the Environmental Plan (EP), NOPSEMA has returned with a request for further written information and a subsequent Opportunity to Modify and Resubmit.

This addendum report addresses these NOPSEMA requirements, and includes:

- Minor ethnohistorical research required by NOPSEMA feedback.
- A description of the underwater cultural heritage / places within the submerged environment.
- A review of previous archaeological assessments across the EMBA, to describe areas sensitive to Aboriginal cultural heritage within the offshore environment.
- The background review will allow for the development of a geospatial landside predictive model utilising the Victorian Aboriginal cultural heritage and environmental data.
- Inclusion of publicly available information including the Gunditj Mirring Traditional Owner Aboriginal Corporation (GMTOAC) updated Sea Country Plan (2023) and National Oceans Office's 2002 Sea Country – an Indigenous perspective.
- An updated risk assessment for potential impacts to Aboriginal cultural heritage in the offshore environment.

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1. INTRODUCTION

1.1. Project background

ConocoPhillips Australia is proposing to undertake resource exploration activities in Commonwealth waters off the Otway Basin, Victoria. While ConocoPhillips Australia, as titleholder, has the exclusive right to undertake activities within the offshore area of their title, the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (the Environment Regulations) require that an accepted Environment Plan (EP) be in force before commencing any such activities.

An EP has been developed, including a suite of environmental assessments across the wider region (ConocoPhillips 2024). The EP required an Aboriginal Heritage Assessment of the wide offshore area, which was completed by Biosis in 2023 (Biosis 2023). This assessment covered the complete low threshold Environment that May Be Affected (EMBA), which spans the entire Victorian coastline, and portions of the Tasmanian, South Australian and New South Wales coastlines.

The assessment included background environmental research, ethnohistorical research and search of the Victoria Aboriginal Heritage Register (VAHR) and Tasmania Aboriginal Heritage Register. Following its inclusion in the Environmental Plan (EP), NOPSEMA has returned a request for further written information (RFFWI) and an opportunity to modify and resubmit (OMR). The NOPSEMA feedback highlighted the following requests in their RFFWI:

Item	Description
1.4	Updates to describe all the cultural features of the entire Environment that May Be Affected (EMBA) that may be affected by the activity by incorporating and considering documented and available information, as well as information received by public comments and through relevant persons consultation. The update needs to ensure that relevant evaluations of impacts and risks to all values associated with cultural features of the environment are also updated and that suitable control measures are adopted, in consultation with relevant persons (where applicable) to demonstrate that impacts and risks will be managed to acceptable levels.
3.4	Include details of all impacts and risks to cultural features of the environment from the activity and a commensurate evaluation of all impacts and risks, appropriate to the nature and scale of the activity, with supporting evidence that the evaluation is appropriate to those who hold the value.
	Define acceptable levels of impact and risk and compare to predicted levels of impact and risk to cultural features of the environment to demonstrate acceptable levels will be achievable.
	Consider and adopt appropriate control measures in consultation with relevant persons (where applicable) to demonstrate impacts and risks will be managed to acceptable levels.

Item	Description
	Incorporate appropriate Environmental Performance Outcomes (EPOs) to reflect the acceptable levels of impact and risk and adopt Environmental Performance Standards (EPS) and measurement criteria
	Provide more detail on the appropriateness of the Cultural Heritage Protection Program (CHPP) and how the information will be reviewed, including how the CHPP will be developed, what timeframes will be included and at what point the process will the CHPP be implemented
	Update the Oil Pollution Emergency Plan (OPEP) to provide more detail on implementation of the Cultural Heritage Protection Program during spill response activities including relevant EPS.

In relation to the OMR, NOPSEMA requested additional information on the description of the environment in relation to underwater cultural heritage, and additional evidence that all impacts and risks will be managed to acceptable levels.

1.2. Scope

Given these requirements, Extent Heritage developed an Addendum to the existing Environment Plan (EP) which addresses these NOPSEMA requirements. This addendum includes the following:

- Ethnohistorical research required by NOPSEMA feedback.
- An updated description of the underwater cultural heritage / places that may be within the submerged environment.
- A review of previous archaeological assessments across the EMBA, to describe areas sensitive to Aboriginal cultural heritage within the offshore environment.
- The background review has allowed for the development of a geospatial landside predictive model utilising the Victorian Aboriginal cultural heritage and environmental data.
- Inclusion of publicly available information including the Gunditjmarra NYAMAT MIRRORING Plan 2023-2033 (2023), National Oceans Office's 2002 Sea Country – an Indigenous perspective and Meerreengeeye Ngakeepoorryeeyt Our Country Plan, 2015.
- An updated risk assessment for potential impacts to Aboriginal cultural heritage in the offshore environment.

1.3. Background

Sea level has changed dramatically over time, and during the last glacial maximum c. 20,000 years ago, global sea level was much lower than today. Large areas of what is now seabed were once habitable land, and as sea-levels rose, these landscapes were inundated and are currently submerged. During the mid-Holocene, between c.7,000-2,000 years ago, sea levels were 1.5m higher than they are now (Dougherty et al., 2019). These cycles of marine transgression and regression

have significantly influenced the region's coastline, landforms, cultural heritage and archaeological resources.

These changes in landscape / seascape are familiar to the Aboriginal peoples of Australia who maintain strong connections to Country that was inundated by sea after the last Ice Age. However, the broader study of submerged terrestrial landscapes around the Australian coast is at a relatively early stage compared to parts of Europe and the USA. This is despite groundbreaking work in the 1980s (Flemming 1982), and a long-held understanding of the potential for archaeological remains on the Australian Continental shelf (Nutley 2005). This may be partly influenced by low levels of major marine development to drive data acquisition and baseline study, and stimulus for a clear heritage management planning and conservation framework for submerged terrestrial archaeology in Australia. As a result, our scientific understanding of the distribution, chronology, preservation, and archaeological potential of submerged landscapes, as a complement to Aboriginal peoples' understanding of their cultural significance, is currently very limited. Recent developments suggest that this is changing with both the *Deep History of Sea Country* Australian Research Council project¹ and European Research Council funded ACROSS project focused on submerged terrestrial archaeology in the north and north-west of Australia. However, research in south-eastern Australia has been limited to relatively modest underwater surveys and other scoping studies, which have focused on inshore areas and embayments (see for example Nutley, Coroneos and Wheeler 2014; Steyne 2007; 2008; 2009).

1.4. Study areas

Offshore exploration area

The '**offshore exploration area**' discussed in this report is defined by the offshore components of the potential Otway Exploration drilling operational area of the project. The extent of the offshore exploration area is shown in Figure 1 below.

Onshore model area

An '**onshore model area**' has also been defined for the purposes of developing a terrestrial archaeological predictive sensitivity model. The onshore model area for this report is defined by a 100m distance from the current shoreline. The data gathered across environmental and archaeological variables has been analysed from this area to develop the terrestrial sensitivity model. Although the onshore model focusses on the Victorian coastline, analysis of other state coastlines has been conducted in this assessment and can be applied more broadly (e.g. as shown in Figures 8-12).

¹ View the project website at: <https://deephistoryofseacountry.com/>

Environment that May be Affected (EMBA)

The Environment that May be Affected (EMBA) was developed in the EP to consistently describe where a change in the ambient environment condition has the potential to occur because of the planned activity and unplanned events. The EMBA is based on the largest predicted spatial extent that hydrocarbon could extend in any direction, based on the modelling of 1400 hypothetical of a loss of well control (LOWC) events, and represents the low threshold EMBA. The EMBA extends offshore around the entire Victorian coast, also including the north and western coasts of Tasmania, eastern South Australia and southern New South Wales.



Figure 1. The proposed Otway Exploration offshore exploration area, Environment that May Be Affected (EMBA) and onshore model area.

2. ABORIGINAL ETHNOHISTORY

Aboriginal cultural concepts are firmly intertwined with the nature of the environment, of Country. Country describes both the tangible and intangible elements of a place: environmental, spiritual, lore, and biocultural identity. The part of Country that extends into the oceans is known as Sea Country with values that differ between Aboriginal groups; not all Aboriginal groups and communities in Australia hold the same belief systems as formational pillars of their community or spirituality. Differences can be due to aspects of post-colonialism, such as dispossession, genocide and cultural practice restrictions.

The land adjacent to the EMBA is relevant for considering the potential Traditional Owner groups with interest in the Sea Country. It is possible that boundaries of traditional ownership extend into the sea, beyond the coastal and intertidal zones, however, these connections and boundaries may have changed over time and are non-linear constructs. The adjacent land-side area is also relevant in that it provides the best available analogue for the way in which land, which has since been inundated, was likely to have been used in the past, prior to sea level rise.

The Gunditjmarra Country Plan *Nyamat Mirring* recognises four landscapes across Gunditj Mirring (Commonwealth of Australia 2017, 14): Wooroowarook Mirring (Forest Country), Bocara Wooroowarook Mirring (River Forest Country), Tungatt Mirring (Stone Country) and Nyamat Mirring (Sea Country) with Nyamat Mirring defined by the meeting of salt and fresh water. Abundant in shellfish, fish and birds, it also has connections to a history of conflict and violence between the Gunditjmarra and colonial settlers, as discussed in Section 2. Nyamat Mirring includes the submerged landscape and the place where the spirits of Gunditjmarra ancestors cross the sea to Deen Maar.' The Wadawurrung 'see our *Dja* land and *Warre* sea Country as all one' (WTOAC 2020:42).

In 2023, Biosis prepared a report describing the cultural significance of Sea Country across Traditional Owners groups. Traditional Owner groups were identified as "Primary" or "Secondary" according to each groups' proximity to the study area. The primary Traditional Owners groups were (from west to east) Gunditjmarra (Victoria), Eastern Maar (Victoria), and Palawa/Pakana (Tasmania). Secondary Traditional Owners groups were Wadawurrung, Bunurong and Gunaikurnai. The Sponsor consulted the report in addition to other reports to inform their Environment Plan. Through consultation, the community identified the needs for specific references to marine species of cultural significance.

This section will identify some specific species and places of cultural significance relating to Sea Country to Traditional Owners located within "Primary" and "Secondary" areas of the study area. It is important to note that this section is not exhaustive and is limited to knowledge shared by Traditional Owners within the public realm (non-sensitive knowledge) acknowledging that detailed descriptions, for example of totem significance, are sometimes not shared outside of Traditional Owner groups. Therefore, this section should be viewed as representing examples of culturally

significant species and places freely available to the author within the given timeframe. The author has used as great a diversity of sources as possible and has used direct quotes from Traditional Owners where possible.

It is clear that the sea provided innumerable resources to Aboriginal people in the past, and ethnographic and archaeological evidence for various sea dependencies are known. The below considers the results of consultation, as well as publicly available information, and ethnographic sources. The below is not intended to be an exhaustive list of resources used, but it does explore common themes and examples throughout the EMBA, and it considers a range of cultural practices carried out by Aboriginal communities.

Frequently, tangible resources, such as food items, animal and plant species, and other resources, such as stone, bone and wood, are also tied strongly to intangible elements of Aboriginal culture. Aboriginal people of Tasmania, the Palawa/Pakana, were noted for creating durable and waterproof containers of sea-kelp threaded and dried to shape on wooden handles. In addition, shells were collected and worn as adornment. Throughout southeastern Australia, reports of seaweed use include for cultural and ceremonial activity, medicine, clothing, food, fishing, and domestic/shelter uses (Thurstan et. al 2018). The Wadawurrung, for example, used “pink seaweed” as a poultice for jellyfish stings (Lane 1980).

Other fish and shellfish species have been noted by community, including abalone, cockles, crayfish, and rock lobster. The Eastern Maar have noted the migration routes of crustaceans as of notable significance. The Wadawurrung mention that crayfish, mussels, oysters, pipis, and fish provided important bush tucker, medicines, and other resources. Fish were caught using hooks, nets and traps (WTOAC 2020:32). Other species were specifically not eaten or associated with other custom, for example, the Stingray (*Baalangurk*) was not eaten by the Kurnai (Howitt n.d. 112). Swans were hunted with boomerangs and spears, whilst other birds were caught in nets woven from plant fibres (WTOAC 2020:32).

It has been well documented that the Gunditjmarra employed complex systems of aquaculture, comprising channels, weirs, and dams, to harvest kooyang (eels) on their Country (Commonwealth of Australia 2017, 16). The migration of eels from freshwater to the ocean and back is integral to the survival of the species, and their physical health is inherently tied to the spiritual values of the Gunditjmarra. The aquaculture system is an economic and social base for Gunditjmarra society (Commonwealth of Australia, 2017). Other coastal and river groups, including the Wadawurrung (buniya) and Bunurung, also utilised eels as an important resource and seek to protect their migration along rivers, creeks, and into the oceans.

Kooyang travels through Nyamat Mirring as far north as New Caledonia through Bocara Mirring and into Tungatt Mirring, to be harvested at the cultural landscape known as Budj Bim (Gunditjmarra Nyamat Mirring Plan, 2023- 2033). The eel is culturally significant to Gunditjmarra as an important cultural resource both for the purposes of clan group consumption as a protein-rich foodstuff, and as an important trading resource preserved via smoke for trade across Country. While the short-finned eel is of cultural significance to the Gunditjmarra more broadly, it is of particular importance

to the clan group of Tae Rak (Lake Condah) and surrounds, the Kerrup Jmara (people of the lake). Also, of cultural significance to Gunditjmara is Karntubul also spelt Koontapool (Southern Right Whales) of Koontapool Woorkngan Yakeen (Whale Dreaming). Every year Karntubul travel from Antarctic waters using the southern song lines of Gunditjmara (along the coast) to feed and birth. Their birthing Country covers east of the Hopkins River in Warrnambool to the sacred site of Johanna Beach in the Southern Otways, Gadubanud Meerreeng (Country of the King Parrot Speaking People) east of Cape Otway (Bundle & Rushton n.d., Gunditjmara Nyamat Mirring Plan, 2023- 2033: 19). Beached Karntubul was both an important food source and cultural practice in which Gunditjmara would send up smoke signals signifying the beaching of a whale. Koontapool Woorkngan Yakeen connects Aboriginal groups across the southern coast and is not specific to any whale species but extends to all whales on Nyamat Mirring (Gunditjmara Nyamat Mirring Plan, 2023- 2033: 19). Koorn Moorn (seals) also played an important role in the lives of Gunditjmara People. Their significance is also represented in Gunditjmara song and dance, and they continue to be used as a cultural food source. Koorn Moorn were collected by women along the coast, with evidence at Tarragal cave site dated to 10,000 BP (Gunditjmara Nyamat Mirring Plan, 2023- 2033: 19).

The Kulin and Kurnai Dreaming Story of Sea Country includes that of Lo-an and his wife Lo-an-tuka surviving mostly on eels cooked in a *marin-a-thung* (earth oven) on the Yarra flats. After finding a feather on his chest, Lo-an with Lo-an-tuka proceeded to follow the breeze to find the swans that the feather had come from and walked to the shores of Western Port. They camped for a long time feeding on swans and continued following the coastline to Corner Inlet. The Kulin believe they became the stars Sirius and Canopis. The Kurnai believe Lo-an is upon his mountain and looks out towards to sea, watching over the people (Massola 1968,81-2).

To the Gunaikurnai, the cultural significance of marine species is told through the GunaiKurnai creation story of Borun (Pelican) and Tuk (musk duck), the parents of all GunaiKurnai people. Places are of cultural significance as the locations that communicate GunaiKurnai lore. Regarding Sea Country, an example of this is Wallung (Legend rock).

Places tell stories of an evolving and shifting Sea Country, of geological time. This includes, Bung Yarnda - Lake Tyers Creation Story which connects GunaiKurnai to Sea Country since the last glacial maximum, when the land bridge connecting GunaiKurnai Country and Palawa/Pakana Country flooded. The story, as told by GunaiKurnai is as follows -

Narkabungdha, the sea, was tired from playing with fish, rushing over rocks and rolling up and back on the sand. He searched the coast for somewhere to rest. At last, he found a quiet place with tall gum trees for shade and soft earth to lie on. Narkabungdha lay down to sleep. He wriggled down into the soft sand, turning his body this way and that until he was comfortable. This place became Bung Yarnda (Lake Tyers), a place where Narkabungdha still rests among the trees.

Whales and whale migration have been noted as of significance by coastal groups in Victoria and South Australia. Eastern Maar have noted the migration routes of the Southern Right and Blue

Whale as of social and cultural importance. The same whale species are similarly noted by the Gunditjmara, Wadawurrung, and Ngarrindjeri.

Aboriginal communities in the southeast of Australia often saw whales as spirits that transformed when they entered the water, creating a respectful relationship between whales and Aboriginal communities. Whale hunts took place from small, shore-based vessels, and targeted smaller animals (Eldridge 2015, 28). In New South Wales, whale hunting targeted migrations from the Pacific to the Southern Ocean. Aboriginal methods of hunting may have included using fire and smoke to lure the whales to the coast and bays (Eldridge 2015, 41), and the opportunistic utilisation of beached whales also occurred, which may have prompted periods of intense gathering of people and ceremony like those observed by early settlers such as Henty (Eldridge 2015). In Howitt's notes on the Kurnai, whales are called *Ganda* - 'Dead whales thrown up by the sea were supposed to have been killed by the *Mrarts* [ghost or spirit] and birds called *Yauruk* [or *Yara-wuk*] and sent ashore. The *Mrarts* then communicated to the *Biraaks* who told the Kurnai where to go and find the *Ganda*. (Howitt n.d:32).

The Gunaikurnai have noted bottlenose Dolphin at Lakes Entrance, and the significance of dolphins is echoed by the Wadawurrung. Wesson (2001:10) notes that 'the souls of prominent community leaders [were] reincarnated as dolphins and orcas.

When the land bridge connecting mainland Australia and Tasmania submerged following the last glacial maximum approximately 12,000 BP, the islands of Bass Strait became isolated from the mainland of Australia and Tasmania. Following this, only elevated Bassian plain elements including those now known as King Island and the Furneaux Group of islands remained. While this research did not identify any direct, publicly available, ethnohistorical information for King Island, the archaeology and geology may indicate Aboriginal People's connection to it and this report acknowledges present-day connections to that place to Palawa/Pakana People.

The geological shift resulting from the last glacial maximum would have had significant impacts on the ecology of the Bassian plains. As sea levels rose, coastal boundaries encroached, and the climate became warmer and less arid (Bowdler 2015). Following this oceanic event, Palawa/Pakana People lived on the Furneaux Islands until approximately 4,000 BP, while archaeological evidence of occupation at King Island suggests Aboriginal people abandoned the region returning in sporadic periods of occupation hypothesized as perhaps accidental seafaring movements from north-west Tasmania until as recently as 1,100 BP (Sim, 1990). Today the island is a mass of dead coral, pebbles and sand settled out from Wellington Point, it is abundant in crustaceans, tiny crabs, limpets and grey mud whelks as well as larger crabs, with a diversity of water birds providing Aboriginal People with nutrient-rich food resources (Community Leader, 2021). It is noteworthy that the Parperloihener people of Robbins Island lived in the north-west of Tasmania and archaeology suggests potential movement between that region and King Island following the area's isolation from the mainland. Robbins Island is well known as the birthplace of Tunnerminnerwaite (waterbird) and Maulboyheener; Parperloihener freedom fighters who resisted early European encroachments on Country and were ultimately hanged in Melbourne at the present-day site of the Victoria Market. Today the Island is also known as Erobin. Aboriginal connections to King Island before colonization

is understudied and should be subject to further research in the future. Further information relating to this history of human occupation is explained in Section 3.2.

However, Palawa/Pakana culture and connection to the Furneaux islands and surrounds remains strong along the eastern portion of Bass Strait. One such cultural connection to Sea Country for Palawa/Pakana is the Pilot Bird. The Pilot Bird is a white short-tailed shearwater which leads its flock of brown/black shearwaters on migratory journeys. The flock that follows the Pilot Bird is one of the most important food and trading sources to Palawa/Pakana People of the Furneaux Island Group, particularly on Flinders and Babel Islands. Although the same breed as the Mutton Bird, the Pilot Bird is distinctive for its white colour over the black/brown Mutton Bird. The Mutton Bird is known for its strong smell and extracted by hand from burrows while the Pilot Bird is not permitted to be hunted (Little J and Big Cuz, Episode 2). Mutton birds are abundant across the islands of Bass Strait, with an estimated 18 million birds breeding in 211 colonies across the Furneaux Islands though the largest colony is located on Babel Island with 3 million burrows (Jenkins 2023). Despite the significant impacts of colonization, especially the Black Wars since the 1820s, mutton-birding continues to connect Palawa/Pakana People of the Bass Strait with Country and their ancestors. The cultural practice of hunting and processing Mutton Birds remains central to Palawa/Pakana life. And while the method of catching the bird has remained the same for millennia the processing of the bird changed (Jenkins 2023).

3. ABORIGINAL ARCHAEOLOGY REVIEW

The Biosis report includes summaries of previous archaeological work in the region, analysed by Traditional Owner areas. The summaries are quite brief, and specific to the location of Aboriginal places across the region. This section expands on the Biosis summaries, utilising the predictive power of previous research for input into the terrestrial predictive model. This model supports the assessment of potential risks to areas of cultural significance along the coast in the highly unlikely event of an accidental release of hydrocarbons and can be extended to coastlines where more detailed information may not be available.

3.1. Victoria

Aboriginal Places along the eastern coast were noted by European colonisers as early as 1906. Kenyon, Pritchard and Kershaw undertook field survey of Wilsons Promontory from Shallow Inlet to Oberon Bay (AASC 2002). They noted shell middens, stone tools (quartz and flint flakes; axes; hammers; grinding stones), faunal remains and a single bone tool. A diversity of marine and terrestrial food resources was available in proximity to these Aboriginal Places (AASC 2002). A 1918 survey undertaken by Spencer and French identified 'kitchen middens' that extended along the western coastline of Wilsons Promontory from Darby River to Shallow Inlet (AASC 2002). These were predominantly surface scatters of shell material, though some were observed to extend 'several feet' into the subsurface context as stratified deposits (AASC 2002). The most common shellfish species identified in these middens were *Turbo undulatosor* and *Subnina undulata*, both of which are found on reefs located north of the Darby River.

Following from John Mulvaney's seminal work on coastal archaeology at Glen Aire in the late 1950s and 1960s, Peter Coutts' (1967) postgraduate research and later work by the Victorian Archaeological Survey (Witter 1977; Coutts *et al.* 1976, 1977, 1978; Coutts 1985) comprise the first systematic archaeological research within the study area. Relevant conclusions with outcomes relevant for predictive modelling from these and more recent regional reviews are outlined below.

Coutts (1967) undertook the first formal study of Gippsland coastal archaeology on the Yanakie Peninsula (Wilsons Promontory). The majority of Aboriginal Places were identified through surface survey. As such, there is potential that the results of this study have been skewed by research bias: middens are easily identifiable in an erosive shoreline context. Inland surface and subsurface deposits may be obscured by the dense coastal scrub found across Wilsons Promontory. This study involved surface survey of selected areas resulting in the identification of 35 Aboriginal Places, predominantly shell middens. Two excavations were undertaken on the western flank of the Yanakie Peninsula. Radiocarbon dates were obtained from these excavations. Based on this, Coutts has proposed three distinct occupation horizons:

Yanakie A assemblage: 3000-6500 BP

The Yanakie A assemblage comprised flakes, blades, backed artefacts (geometric microliths and Bondi points), hammers and anvils. Quartzite is the most prolific raw material type, predominantly used in the production of backed blades and other small tools, with quartz also being exploited for small tool production. Flint was generally used to produce larger tools. There is an apparent lack of shell and bone artefacts in the Yanakie A assemblage. This could potentially be a result of preservation bias, as opposed to an indication of typology.

Excavated soils were shown to contain elevated levels of phosphorus, which may be indicative of bone decomposition (Freslov and Frankel, 1999). Most shell middens in the Yanakie A assemblage are comprised of rock platform species (*Cellana* and *Subnivalia* in particular). These middens do not show evidence of hearths or charcoal deposits, suggesting that rock platform species may have been consumed raw. Coutts (1967) concludes that the Yanakie A assemblage is reflective of small bands of 10-30 people ranging along the coastline for short periods, rather than demonstrating long-term occupation of coastal campsites. It is suggested that this coastal exploitation likely took place during spring and summer, when berry trees were fruiting, and birds were nesting.

Coutts argues that 'base camps' were generally established in proximity to fresh-water swamps, which would be used as a primary campsite while hunting food sources and accessing raw materials for stone tool production. Flint is present in the local landscape as beach pebbles, and as inclusions in local granite outcrops. There does not appear to be a quartzite source on Wilsons Promontory: it was likely procured elsewhere, potentially from the foothills of the high country that lie 60km north of the Promontory.

Yanakie B assemblage: 3000-1000 BP

The Yanakie B assemblage has a lower frequency of artefacts as compared to the Yanakie A assemblage – of note is the absence of backed artefacts. This is counter to the assertion that backed artefacts proliferated during the Holocene and could be used as relative chronological markers in Australian archaeological assemblages (Lourandos 1980). Ground-edge axes appear in the Yanakie B assemblage. Material for the ground-edge axes may have been obtained from Cape Liptrap, where there is a known source of greenstone (Gardner *et al.* 2009:2). 'Unofficially worked pebbles' are also recorded: it is unclear what is meant by 'unofficially worked' in this context, but it may be in reference to the collection of flint nodules – present along the shoreline – as part of lithic production. Quartz and flint are the dominant raw material types, with relatively little quartzite in comparison to the Yanakie A assemblage. Yanakie B is characterized by local, easily obtainable raw materials, and has a higher abundance of bone and shell artefacts than the Yanakie A assemblage.

It is unclear whether this is a result of preservation bias or is an indication of actual differences between the assemblages. In contrast to Yanakie A, the Yanakie B midden material is dominated by sandy beach shellfish species (predominantly *Plebidonax*, referred to locally as pipis). Coutts suggests that Yanakie B demonstrates similar patterns of landscape use to Yanakie A, where groups of 10-30 people accessed the coastline for short periods. The presence of *Cabestana* shells in midden deposits suggests seasonal use during spring and summer.

Terminal Phase: 1000 BP – present

Coutts (1967) draws on ethnohistories and oral histories to understand the occupation of Wilsons Promontory during this time – material evidence dating to this ‘Terminal Phase’ was not located within the archaeological record. Coutts asserts direct continuity between Yanakie B and the Terminal Phase based on this ethnohistoric and ethnographic data.

The points of variation between the Yanakie A and B assemblages were considered by Coutts to be symptomatic of climatic variation that occurred during 6500-3000 BP, which then resulted in minor changes in the flora and fauna of the Promontory. This climatic shift also led to the formation of new dune sequences along West Yanakie. These physiographic changes include the formation of sandy beaches which were subsequently populated by *Plebidonax* species. *Plebidonax* (pipis) appear to have been the dominant food source during the Yanakie B phase. It should be noted that Coutts’ analysis of coastal occupation is informed by ecological models. As such, his analysis does not necessarily account for how the socio-cultural matrix and cosmology of Aboriginal peoples may have influenced Aboriginal Place patterning along the Victorian coastline.

Relevant conclusions for predictive modelling include:

- Coastal Aboriginal Places are predominantly identified based on the presence of shell middens.
- Coastal Aboriginal Places are found in proximity to fresh-water swamps.
- Middens located on shore dunes are more easily identified in the landscape due to erosion and accessibility. Inland and hinterland coastal Aboriginal Places may be obscured by dense coastal vegetation.
- The socio-cultural and cosmological context of Aboriginal landscape use should be accounted for in predictive models. Coastal archaeological analyses are based on ecological modelling - this does not necessarily reflect the full nature of landscape use by Aboriginal people within the study area.
- A-series Pleistocene dune deposits predominantly contain middens comprising rock platform shellfish species.
- B-series Holocene dune deposits predominantly contain middens comprising sandy beach shellfish species.
- Ground-edge axes are present in the Yanakie B assemblage (associated with B-series Holocene dune deposits). There is a greenstone source located at Cape Liptrap, west of Wilsons Promontory.

Following from his preliminary thesis work, during his time as director of the Victorian Archaeological Survey (VAS), Coutts co-ordinated a range of regional studies, with a view to developing a coastal subsistence model for the Victorian coastline. Coutts *et al.* (1976) address the archaeological components of phase one of studies coordinated by the Town and Country planning board to identify special scientific sites of interest on Victoria’s coastal margin, including the study area of this report. This research was initiated in 1974 and reviewed all archaeological data collected along the coast, including published Aboriginal Places and excavations.

Coutts *et al.* attempted generalisation on Aboriginal Place classification, location and site contexts for the coastal margin, concluding that 47% of Aboriginal Places (excluding scarred trees) were located in Holocene dune systems, and 24% were on cliff areas. Other areas where Aboriginal Places occur are on the margins of swamps, hillsides and coastal plains. No scarred trees were recorded on the coastal foreland. They also note that where sequence or barrier dunes have developed, older Aboriginal Places are more likely to be inland and covered by vegetation. Coutts *et al.* note that as of 1976, the scarcity of research undertaken to date meant that general locational patterns were not likely a reflection of archaeological distribution and were rather biased by survey selection, areas of exposure, visibility and composition (for example, shell middens are likely to be more conspicuous than artefact scatters).

Relevant conclusions for predictive modelling include:

- As of 1976, 49% of all recorded coastal Aboriginal Places in Victoria were on Holocene dune systems and 24% were on cliff areas, however, there are problems with using these places as the basis of a predictive model due to the potential of research and preservation bias.
- Where sequence and barrier dunes have developed, older Aboriginal Places are more likely to be inland and covered by vegetation.

In a subsequent 1976 paper, Coutts gives a brief review of archaeological research in pre-invasion Victorian archaeology at the time of publishing. The results of this are largely covered in Coutts *et al.* (1976) above: an outline is provided here in order to establish and strengthen the conclusions of these regional reviews, with specific reference to food resources.

Coutts notes that rock platforms provide access to an abundance of food sources, such as shellfish, fish, sea birds (including mutton birds), seals. Along much of the Victorian coastline, it appears that people largely exploited shellfish as a source of food and, by inference, a wide range of vegetable foods (Coutts 1979, 63, Hope and Coutts 1971, 105). Rockshelters, river terraces and mounds were favoured for inland occupation (Macpherson 1884).

Relevant conclusions for predictive modelling include:

- Coastal plains with access to hinterland forests are resource-rich areas favoured for occupation.
- Rock platforms provide access to a diversity of food sources (shellfish, fish, sea birds (including mutton birds) and seals). Seal colonies were present within the study area at Wilsons Promontory.
- Rockshelters, river terraces and mounds were favoured for inland occupation.
- Shellfish is considered to be the main food source for coastal populations. However, this data may be skewed by research and preservation bias. This should be accounted for when using midden sites in predictive models.

Frankel *et al.* undertook field investigations along the South Gippsland coast. They found most coastal middens sites were eroding or deflating behind the foredunes and were poorly preserved. Along most sections of the coastline, there were between four and six Aboriginal Places per

kilometre. Two-thirds of the 66 Aboriginal Places investigated contained stone artefacts and half of these had large quantities of stone relative to shell. Densities of artefacts were generally low, in most cases less than 0.17 artefacts per square metre. Most of the stone material comprised 'waste flakes from the manufacture of small tools, mainly thumbnail scrapers and backed implements.

The study concluded that most of the coastal Aboriginal Places were 'of small-scale shell or stone deposits, varying a little in relation to site-specific factors. There were no substantial Aboriginal Places, nor any distinct patterning of Aboriginal Place location or contents. The authors interpreted the coastal Aboriginal Places of South Gippsland as representing casual dumping of shells rather than foci of repeated, long-term activity. They argued that the coastal Aboriginal Places were products of occasional visits from more economically significant inland locations.

The relative paucity of coastal occupation and use cited by Sullivan, Frankel *et al.* and others may be the result of either superior resources and more suitable occupation environments in the hinterland, or to the relative lack of large estuaries (and their rich plant, fish and shellfish resources) along the Victorian coast.

Relevant conclusions for predictive modelling include:

- Coastal midden sites are often found within highly erosive contexts (e.g. back-slope of coastal foredunes) and are often poorly preserved.
- No distinct Aboriginal Place patterning was identified during this study.
- Aboriginal Places that are foci of repeated, long-term landscape use are likely to be found inland, with access to a mosaic of environments with diverse resources.
- Coastal Aboriginal Places in South Gippsland appear to be the product of seasonal, opportunistic exploitation of local resources. A such, coastal Aboriginal Place patterning may not reflect long-term trends in landscape use.

Freslov and Frankel (1999) undertook a regional review of pre-invasion Victorian coastal archaeology to assess regional patterns and chronological trends. This regional synthesis was an effort to formulate a coastal subsistence model in response to the work of Coutts (1967, 1976), Coutts *et al.* (1976) and Lourandos (1983), which assert a linear model of coastal intensification across the Pleistocene-Holocene transition. These models of coastal intensification are largely based on survey of midden sites (in which the data is inherently skewed), and interpretation of stone tool industries as a proxy for cultural 'advancement'. Freslov and Frankel (1999) assert that coastal occupation does not necessarily imply exclusive exploitation of littoral resources. Rather, a mosaic of resource use – which may not be defined by resource availability alone – can apply. Ecological factors are one of the main drivers of settlement patterns along the Victorian coast: however, socio-cultural and cosmological contexts are also likely to influence Aboriginal Place patterning.

This regional review makes note of the diversity of coastline environments: cliffs, sandy bays and offshore islands (e.g. Wilsons Promontory); high-energy coastlines with sandy beaches subject to high wave stress (e.g. Ninety Mile Beach); estuaries and associated lakes and barrier dunes and islands (e.g. Gippsland Lakes, Corner Inlet). Hinterland and wetland resources are also available in proximity to these coastlines. Freslov and Frankel conclude that the majority of food resources in

the south-east would have been centered around the lake systems and swamps: rocky shorelines, inlets and river mouths would have provided access to similar resources in the south-west of the study area.

Freslov and Frankel (1999) note the issue of developing a regional model: namely, there is high risk of research bias in previous coastal studies (e.g. Coutts 1976). Survey of coastal areas has necessarily been focused on the foreshore, due to the dense vegetation that occurs further inland. Middens are generally present on the back-slope of foredunes in a highly erosive environment: as such, middens are far easier to identify in the landscape. Stone artefact scatters (both surface and subsurface) located further inland are far less visible. Ecological frameworks remain the most widely used and accepted in Victorian coastal archaeology (Freslov and Frankel 1999). However, this fails to account for the rich social, cultural and cosmological framework for how Aboriginal and Torres Strait Island peoples live and move on country.

Formal archaeological research began in Victoria's west in the 1940s. From the 1940s to the 1960s, studies of the archaeology of the region appeared (for example McCarthy 1941; Mulvaney 1957 and Mitchell 1949). These studies reviewed previous stone artefact finds and Mulvaney's work began the first systematic surveying of parts of the study area, focused on areas to the west of Portland. During this period, focus was given to categorising lithic typologies into regional archaeological 'cultures' across southwest Victoria and southeast South Australia. Little at the time was known about the depth of Gunditjmara history, and Mulvaney noted in 1957 that thus far, archaeological work in the region was limited to ad hoc descriptions of isolated artefacts 'collected loose on the surface, others ... been fossicked out of middens' in absence of contextual recording (Mulvaney 1957, 32).

Mulvaney's February 1957 survey of the Lower Glenelg River, was the first to be undertaken in the area, based on a predictive model that targeted springs, cliffs, dunes and limestone geology. Mulvaney also noted that the Tarragal Caves at the eastern end of Discovery Bay were known by then for their archaeological potential, and indeed had been 'excavated by unknown fossickers who have turned the site into a complex of hollows and hillocks' (Mulvaney 1957, 43). Mulvaney's program of augur holes in the caves identified ash, bone, shell, and flint flakes.

From the 1970s, site-specific and widescale archaeological programs were undertaken across southwestern Victoria, including within the onshore model area. This included survey and research excavations involving radiometric dating at Tarragal Caves (Lourandos 1983; Witter 1977) and the formulation of regional chronologies and interpreted settlement regimes. The findings from this research were fundamental in Lourandos' argument around 'intensification' in population and resource use across Aboriginal Australia in the last several thousand years (Lourandos 1983). During this decade, the passing of the Archaeological and Aboriginal Relics Act 1972 (Vic.) led to the establishment of the Victorian Archaeological Survey (VAS), which completed large-scale surveys in southwestern Victoria, including parts of the onshore model area, establishing baseline records of surface material culture (Coutts 1985). The work undertaken during this decade also led to an increased understanding of the Newer Volcanics geological province as containing unique archaeology in the region.

The coalescing of cultural heritage management as a field throughout the 1980s and 1990s led to the production of archaeological research reports undertaken prior to large scale infrastructure projects. This research was generally limited to narrow linear projects that cut across a variety of landscapes or focused on small areas of land subject to impact. Since 2006 and the introduction of the Aboriginal Heritage Act 2006 (Vic.), dozens of small-scale cultural heritage management plans (CHMPs) have been undertaken in area. These localised research programs have led to a recording of hundreds of new sites in the onshore model area over the last two decades.

In 2012, Context Pty Ltd (McNiven 2012) undertook a review of all archaeological research conducted in the Gunditj Mirring RAP area, and produced a report that covered the onshore model area and additional areas to the north and east. This following part of this report reviews relevant archaeological research undertaken inside or including the onshore model area, and which have developed predictive models regarding the location of cultural heritage material within their research areas.

The results of this assessment categorised sites into 'common', 'uncommon', 'rare' and 'possible':

- Common sites include shell middens, stone artefact scatters and deposits, earth mounds and stone houses.
- Uncommon sites include scarred trees/culturally modified trees and fish trapping stone structures.
- Rare sites include fish trapping earthen structures, stone arrangements, rockshelters, rock art, stone tool quarries and burials.
- Possible sites include rock wells, ochre quarries and axe grinding grooves.

Full details of these site types are presented in Table 1.

There are some obvious limitations when assessing the results of previous archaeological research to inform predictive modelling of cultural heritage in the study area. The first is that archaeological research methodologies have changed over time, and research has focused on different types of material cultural and at vastly different scales. The second is that region-wide archaeology programs with systematic sampling of landscapes and landforms were more commonly undertaken in the 1970s than subsequently, and the conclusions of these studies have informed more recent predictive archaeological sensitivity models. This is a limitation as the low numbers of recorded Aboriginal places meant that these early predictive models were based on a subjective understanding of place patterning, rather than statistically significant variation (Coutts (1985) concedes this point in reviewing the VAS surveys of the 1970s).

Based on the above, conclusions relating to the predictive modelling of Aboriginal sites in Victoria include:

- There is a direct analogy between three forms of campsites (mounds, middens, lithic scatters) and where these sites are located. Major campsites are invariably sited in catchments with access to wide range and diversity of resources. Key to location is availability of water and

form of campsite (small, large, semi-permanent) appears correlated with reliability of those sources.

- Campsites, in particular mound sites, occur predominantly in association with stream systems, lakes, swamp and favoured food resources, and within easy access to timber for fuel and housing.
- Larger surface scatters appear highly correlated with perennial water supplies and frequently found in sandy environments along the margins of swamps, rivers and lakes, or are located on or adjacent to areas inundated during winter.
- Mounds and middens are interchangeable in terms of site function, with middens occurring along the coastal margin and mounds occurring inland.
- Earth mounds do not occur randomly in the Western District but are divided between locations with strong seasonal aspect (measured by local hydrology) and locations where it would have been possible to maintain campsites all year round. Mounds tend to occur in poorly drained areas. Not always the case, they tend to exist on flat or slightly undulating land with poorly drained soils, with mounds on slight rises or hillocks to give them vantage and better drainage.
- Length of occupancy, seasonal scheduling and size of campsites directly relate to local hydrology and food resource potential of particular locations.
- Statistical analysis confirms that mounds and lithic scatters tend to occur in clusters or in close proximity, often less than 1 km apart.
- Few campsites are located on treeless plains away from reliable water resources.

Table 1. Predictive model for the Gunditj Mirring TOAC RAP area (McNiven 2012).

Site type	Form	Distribution	Location: Geomorphic features	Location: Mapping layers
Common (>100 recorded)				
1. Shell middens	Shell deposits of marine shells resulting from meals. Midden range in size from 1m in diameter to 100s of metres in length. Most midden deposits are less than 1m in thickness. Middens are often associated with charcoal (from hearths) and stone artefacts. Animal bones tend to be rare. Most sites date to the past 1,000 years but sites up 11,000 years are known (Freslov & Frankel 1999, Fig. 2; Richards 2011).	Concentrated Most shell middens have been recorded within 1km of the coast. For example, along Discovery Bay where most midden have been recorded in the RAP area, middens are generally located 'less than 200 m behind the foredune' with some middens located up to 2.5km inland (Godfrey 1989, Figure 1).	Shell middens occur in a broad range of geomorphic contexts such as sand dunes (e.g. Discovery Bay – Godfrey 1989) and elevated headlands (e.g. Cape Bridgewater – Richards & Johnston 2004).	Sand dunes, within 200m of the coast (similar to existing AAV mapping), not excepting headlands which may feature sand deposits which have become isolated by the disappearance of the 'ramps' of Pleistocene sediments which will have connected them to the shore. Mapping – within 200m of shoreline
2. Stone artefact scatters & deposits	These sites are dominated by stone artefacts and often exclusively stone artefacts. Most sites are surface scatters, but many also exhibit subsurface artefacts and some sites exclusively so. It is assumed that most sites will date to the past 3,000 years, but sites of well over 10,000 years in age will exist given the known antiquity of Aboriginal occupation of the RAP area is at least 13,000 years ago (Bridgewater Cave South – Lourandos 1981), over 20,000 years ago in nearby Gariwerd (Bird et al. 1998) and over 30,000 years ago in the Mallee region (Richards et al. 2007).	Widespread The margins of almost every waterway (creek or lake) in the RAP area will exhibit stone artefacts. Higher concentrations of artefacts (and larger sites) often occur near larger and more permanent water sources.	Stone artefact sites are most readily seen along the banks of rivers, creeks and lakes, often relatively more elevated areas better suited to camping.	Along waterways – similar to existing AAV mapping. Mapping – within 200m of waterways
3. Mounds	Archaeological research indicates that Western District earthen mounds range in size from 3m to 30m in diameter and in height from 0.3m to 1.5m (Coutts 1985a:31). Mounded deposits of dark-coloured sediment containing camping materials such as food remains (e.g. animal bones) and charcoal from fires and pit oven features. Some sites were also subsequently used as burial locations and contain human remains. All mounds in the RAP area have been dated to the past 2,500 years (Bird & Frankel 1991a, 1991b; Williams 1988).	Widespread Mounds sites are found mostly east of the Glenelg River across the RAP area.	'Within the central Western District ... most mounds are located adjacent to creeks, rivers, swamps and other areas of wetland' (Coutts 1985a:31-33). More recent research reveals that mounds are found 'also on tops of hills, on high ground' (Williams 1987:317). Builth (2002:83) suggests the general absence of mounds on stony rises ('lava flow') is 'due to the lack of sediment depth on the landform'.	Adjacent to wetland areas and atop hills. More common to the east of the Glenelg River. Important to recognize probable social function, as a monument in the landscape. Mapping – within 200m of waterways at elevations above 50m
4. Stone houses	Stone houses are made from basalt (lava) blocks that have been stacked to create walls (up to 1m high) or wall bases (<50cm high) that are mostly U-shaped or C-shaped with a diameter usually around 2-3m (see Lane 2008 for a detailed overview). They often contain shallow deposits of occupational remains such as animal bone, stone artefacts, flaked bottle glass artefacts and charcoal from hearths. While all dated house sites occur within the past 300 years or so, older sites are very likely.	Concentrated Limited to 'stony rise' country which has a restricted occurrence in the RAP area (mostly the Mt Napier lava flow and the Mt Eccles and associated Tyrendarra lava flow).	Stone houses occur on basalt lava flows ('stony rise' areas in particular) usually in close proximity to freshwater sources such as creeks and swamps.	Mapping – stony rises (new volcanics)
Uncommon (10-100 recorded)				
5. Scarred trees and other culturally modified trees	Scarred trees associated with bark and wood extraction are a well-known feature of the Aboriginal archaeological record of the Western District (e.g. Rhoads 1992). Recently, large trees with hollow bases have been associated with eel smoking (Builth (2002:152-210, 261-267). Most scars are on larger trees at least 150-200 years old given that only trees usually >50 years old are large enough for viable bark sections and at least 100 years has transpired since Aboriginal people in most areas ceased harvesting bark.	Widespread Scarred trees can be found across the RAP area. Eel smoking trees have only been proposed for the Tyrendarra lava flow.	The ubiquity of scarred trees limited the potential for clear patterning in terms of associations with particular geomorphic features. Occurrence is more critically associated with remnant stands of old trees.	Mapping - pre-1788 remnant forest. But practice continued - Indigenous people employed to obtain bark for European settlers.
6. Fish trapping	These sites are often complex structures incorporating artificially constructed rock walls and natural rock outcrops. They include channels constructed by the addition of side walls and/or the excavation of sediments	Concentrated Most stone-walled fishtraps have been recorded on 'stony rise' country which has a restricted occurrence	Stone-walled basalt lava flows ('stony rise' areas) associated with waterways. In addition, such sites are known to	Fish traps generally operate in the flood zone.

Site type	Form	Distribution	Location: Geomorphic features	Location: Mapping layers
structures (stone)	or removal basalt lava blocks. Structures range in length from a few metres to 300-400 metres (Coutts et al. 1978). They are used to capture freshwater fish, especially eels. They date back to at least 6,600 years (McNiven et al. 2011).	in the RAP area (mostly the Mt Eccles and associated Tyrendarra lava flow). Ethnographic records for the Western District indicate that such sites can be found along any major waterway, especially if rock building materials are nearby (McNiven and Bell 2011).	occur along waterways where basalt blocks are available to construct such sites.	Mapping – within 100m of waterways in basalt geology.
Rare (>10 recorded)				
7. Fish trapping structures (earthen)	These sites consist mostly of channels excavated into soft sediments. Such channels either feed fish into ponds or included organic (e.g. brush) trapping devices. Sites range in length from 50m (e.g. Gorrie Swamp - Williams 1988:166-169) to over 3km in the case of the Toolondo site located immediately north of the RAP area (Lourandos 1980, 1987).	Widespread Despite their rarity, such sites have the potential to occur across the RAP area.	These sites are most likely associated with wetland area, particularly in the vicinity of swamps and waterways.	Along creeks in low lying areas. Mapping – within 200m of wetlands.
8. Stone arrangements	These sites are arranged blocks of stones (often into cairns or curvilinear arrangements) that do not appear to be associated with domestic structures or fishtraps. Such sites are usually ascribed a ritual/ ceremonial status by Victorian archaeologists (e.g. Frankel 1991:Chapter 9; Lane & Fullagar 1980).	Concentrated Limited to 'stony rise' country, which has a restricted occurrence in the RAP area (mostly the Mt Napier lava flow and the Mt Eccles and associated Tyrendarra lava flow). Site recordings for other places in the Western District indicate such sites may occur wherever blocks of stone outcrop.	'Stony rise' country and other areas of rock outcrops.	Stony rises, but also older volcanics, e.g. atop Mt Rouse. Mapping – stony rises (new volcanics)
9. Rockshelters	As the name suggests, rockshelter sites are places within rock outcrops that afford shelter and a place to camp out of the weather. Such sites contain occupational deposit (e.g. shells, animal bones, stone artefacts and charcoal) and rarely rock art (usually paintings). The best-known example for the RAP area is the rockshelter of Bridgewater Cave South (Lourandos 1983).	Concentrated Rockshelter sites are necessarily restricted in distribution to larger rock outcrops which have a patchy occurrence across the RAP area.	In terms of RAP area geology, three types of rock outcrops have known or potential rockshelter sites: basalt lava tubes and collapsed lava domes ('stony rise' country), limestone outcrops (especially along the coast), and granite boulder outcrops (especially in the northeast of the RAP area).	Generally, requires specific geology – occurrence depends on type of granite. Mapping – same as for stone houses
10. Rock art	Both recorded rock art sites are located in the far NE of the RAP area in the Gariwerd (Grampians) region.	Concentrated Like rockshelter sites, rock art sites are necessarily restricted in distribution to larger rock outcrops which have a patchy occurrence across the RAP area.	Rock outcrops, particularly in the Gariwerd (Grampians) region. Lava caves and limestone rockshelters in the southern sections of the RAP should also be considered.	Rock shelters (as above) or outcrops have potential for rock art. Is there mapping of 'granite outcrops'? Mapping – same as for rock shelters
11. Tool stone quarries	Tool stone quarries are locations where stone was extracted for the manufacture of flaked tools (e.g. scrapers) or flaked and ground stone tools (e.g. axes). Key sources include silcrete, chert, flints and quartz for scraping and cutting tools and volcanic rocks for axes. While usually associated with rock outcrops, it is also useful to classify flint cobble beach deposits and riverbed cobble deposits known to have been exploited for tool stone as quarry sites following (Hiscock & Mitchell's (1993:23) definition of a quarry site as 'the location of an exploited stone source'.	Concentrated As only a small range of rock types are suitable for flaked tool manufacture, so too only a limited range of rock outcrops are suitable as tool stone quarry sites. Such outcrops can be small and isolated or part of large rock outcrops.	Any source of highly siliceous stone or fine-grained volcanic rock has a high potential to have been quarried in the past for tool stone.	At the occurrence of rock types. Mapping – occurrences of specific geology (given high enough resolution)
12. Burials	Places with human remains. Burials include ground inhumations, hollow tree inhumations, and rock hollow inhumations. Known burial sites for the RAP area contain fewer than 10 individuals.	Widespread Burial sites have been recorded across the RAP area.	Highly sensitive place for burials (i.e. places with a high potential to reveal human remains) include rock hollows in rock outcrops, mounds, and sand dune (lunette) deposits adjacent to swamps and lakes.	It is likely that many burials will have been contained in mounds (Ian McNiven, pers. comm.), in which case many will have been lost to clearance and agriculture. Mapping – same as mounds

Site type	Form	Distribution	Location: Geomorphic features	Location: Mapping layers
Possible (none recorded to date)				
13. Rock wells	Wells are places within rock outcrops showing evidence of modification associated with rainwater collection and storage for drinking purposes.	Concentrated Any rock outcrop.	Any rock outcrop.	Dependent on geology Mapping – rare and could occur with many of the above. Omit specific mapping.
14. Ochre quarries	Sources of ochreous sediment revealing signs of extraction.	Concentrated As ochreous deposits tend to be rare, so too ochre quarries tend to be rare.	Any rock outcrop.	Dependent on geology Mapping – rare and could occur with many of the above. Omit specific mapping.
15. Axe grinding grooves	As stone axes are a feature of the archaeology of the RAP area (e.g. McBryde 1978), it can be expected that axe grinding groove also occur locally. These sites are locations where stone axes have been shaped and sharpened through rubbing to create a shallow linear depression. Usually these sites represent an abrasive rock such as sandstone located near water which is used to aid the grinding process.	Concentrated As outcrops of abrasive stone such as sandstone located near water tend to be rare, so too axe grinding grooves tend to be rare.	Outcrops of abrasive stone (especially sandstone) located near a water source such as a creek.	Usually, these sites are near a water source, or perhaps low-lying areas which temporarily contained standing water. It may however be that portable equipment was used for tool sharpening. Mapping – rare and could occur with many of the above. Omit specific mapping.

3.2. Tasmania

Biosis provided a comprehensive summary of archaeological investigations and predictive modelling conclusions within Tasmania. The below section is an excerpt from Pages 18-21 of the Biosis report summarising previous investigations across Tasmania (Biosis 2023: 18-21):

Mackay (1946) was the first to identify archaeological evidence of past Aboriginal use of the Bass Strait Islands in the 1930s (see also (Sim 1990). Earlier thoughts were that these were stone artefacts left behind when the Tasmanians were moved to Flinders Island by George Augustus Robinson in the 1830s. It was not until Rhys Jones' work in the 1960s that attention to the Bass Strait islands was made. Sandra Bowdler (1979) excavated at Cave Bay Cave on Hunter Island that provided the first evidence of Pleistocene occupation, dating from 23,000 years. At this time, this was the oldest recorded date of Aboriginal occupation in Tasmania. This was also archaeological proof of the Bassian Land Bridge that once connected Tasmania to Mainland Australia (Sim 1990).

Further work was carried out on Flinders Island and several other smaller islands in Bass Strait showed signs of earlier occupation, including stone artefacts, middens and burials. It was believed at the time that the absence of middens on some islands, but the presence of stone artefacts meant that the midden sites were once closer to the original pre-Ice Age coast, which is now under water (Orchiston & Glenie 1978). The first middens excavated in Bass Strait was by Orchistone (Orchiston & Glenie 1978, Orchiston 1979, Orchiston 1984), however, the full details of the report have not been published. (Sim 1990) recorded a number of middens on Flinders Island in 1989 and noted that many of the remaining midden sites were found where the sea floor drops away abruptly, further suggesting that many of the midden sites were possibly found on ground level now under water due to rising waters after the Ice Age. (Sim 1990) argued that the Bass Strait islands were abandoned before the last remnants of the Bassian Plain land bridge between Mainland Australia and Tasmania disappeared. Davidson and Roberts Davidson & Roberts (2008:20) state:

For a while, perhaps, it was possible to use watercraft to maintain contact with families and friends on the other side but eventually this became more difficult. Boats sank sometimes, or storms and rough seas would have made the crossing perilous. When the sea barrier became too wide, those left on the Tasmanian side turned their backs and never saw their friends and families again. It proved to be a monumental turning point, leading to an independent evolution in their technology, economy, society and culture. They were alone for five hundred generations, knowing no other people in the world, living with the knowledge and beliefs derived from those they had known before the sea surrounded them. They remained isolated from the rest of humanity until that same sea brought the first Europeans in the late seventeenth and early eighteenth centuries.

Brown (1990) conducted excavations on Flinders Island that again proved the antiquity of the Bass Strait Islands, where sporadic occupation from 20,000 years to 8,500 years was found at Mannalargenna Cave on Prime Seal Island. Again, it was hypothesised that the islands were abandoned after 8,500 years due to the rising sea levels (see Sim 1990). Early thoughts at the time state that watercraft between the islands would have been possible, and the sea level rise was gradual and would have been shallower. However, with the rise of waters, also meant that the distance between land masses increased, therefore making travel much harder and dangerous. It is thus why many believe that the islands were abandoned around 6,000 years ago when the seas reached their current levels (Sim 1990).

The flooding of the Bassian Plain meant that the people who chose to remain in Tasmania would soon be isolated for generations. Jones (1971) states '... no other human society, which survived until modern times, had been isolated so completely and for so long'.

Archaeological evidence of occupation in Tasmania range between 34,000 – 40,000 BP. The most accurate date for occupation is from the Parmerpar Rockshelter close to Cradle Mountain that was excavated by archaeologist Richard Cosgrove (Mulvaney & Kamminga 1999, p. 189). This was a time when Tasmania was still a part of the landmass of Australia before it was disconnected with the flooding of the Bassian Plain after the last Ice Age. Further excavations of Kutukina Cave (formally Frasier Cave) in southwest Tasmania established Pleistocene settlement of Tasmania with radiocarbon dates ranging from 15,000 to 20,000 years BP (Kiernan, Jones, & Ranson 1983, Mulvaney & Kamminga 1999, p. 182). At King Island, the earliest recorded archaeological site is 14,000 BP, with more recent occupation at 1,100 BP (Sim, 1990).

By the end of the last Ice Age (12,000 BP) the rising temperatures and subsequent rising sea levels flooded the Bassian Plain and separated Tasmania from the mainland of Australia (Kee 1987, p. 12; Taylor 2003). The formation of what is now known as the Bass Strait ultimately led to the isolation of the Tasmanians from their groups on the mainland of Australia. The resulting 10,000 years of isolation crafted a unique culture and economy that was independent from any mainland Australia influence (Mulvaney & Kamminga 1999, p. 339). A series of environmental and climatic changes started to occur in Tasmania because of this separation with a reduction in rainfall, lower than normal temperatures, some reduction in the seeding of vegetation, as well as the formation of sand dune systems that were to become a prime area for the discovery of Aboriginal remains. Kee (1987, p. 14) stated that these dunes formulated a new abundance of resources available to the Tasmanians, which is reflected in much of the early archaeology of this period. These climatic changes started to stabilise around 6,000 years ago. This has been noted by radiocarbon dating at Carlton Bluff, where dates ranged from 8,000 to 6,000 BP (Dix 2015, pp. 147–8); Kee 1987, p. 12; Neil 1981; Reber 1965), and therefore the range of sites found on the coast are more than likely representative of this 6,000-year figure.

Regionally, sites vary in Tasmania. As such, the state has been divided into three geographic regions. Various studies were conducted in the 1980s and 1990s to understand these regional differences in sites, and to understand more broadly Tasmanian Aboriginal archaeology (Brown 1991; Cane 1980; Cosgrove 1985; 1990; Gaughwin 1985: 52; Jones 1965; 1966; 1967; Key 1991; Lourandos 1968; 1970; 1977; MacFarlane 1993; Stockton 1977a, 1977b; 1982; Sim, 1989, 1990; Bowdler 1994).

Aboriginal Heritage Tasmania provided the heat map in Figure 2 below, that shows the general distribution of recorded Aboriginal heritage along the Tasmanian coastline, and noted the need to 'be aware that there are large areas of the coastline that have never been assessed and therefore the absence of recorded Aboriginal heritage cannot necessarily be taken as an indication that there is no heritage present'.

Aboriginal connections to King Island before colonization is understudied and should be subject to further research in the future.

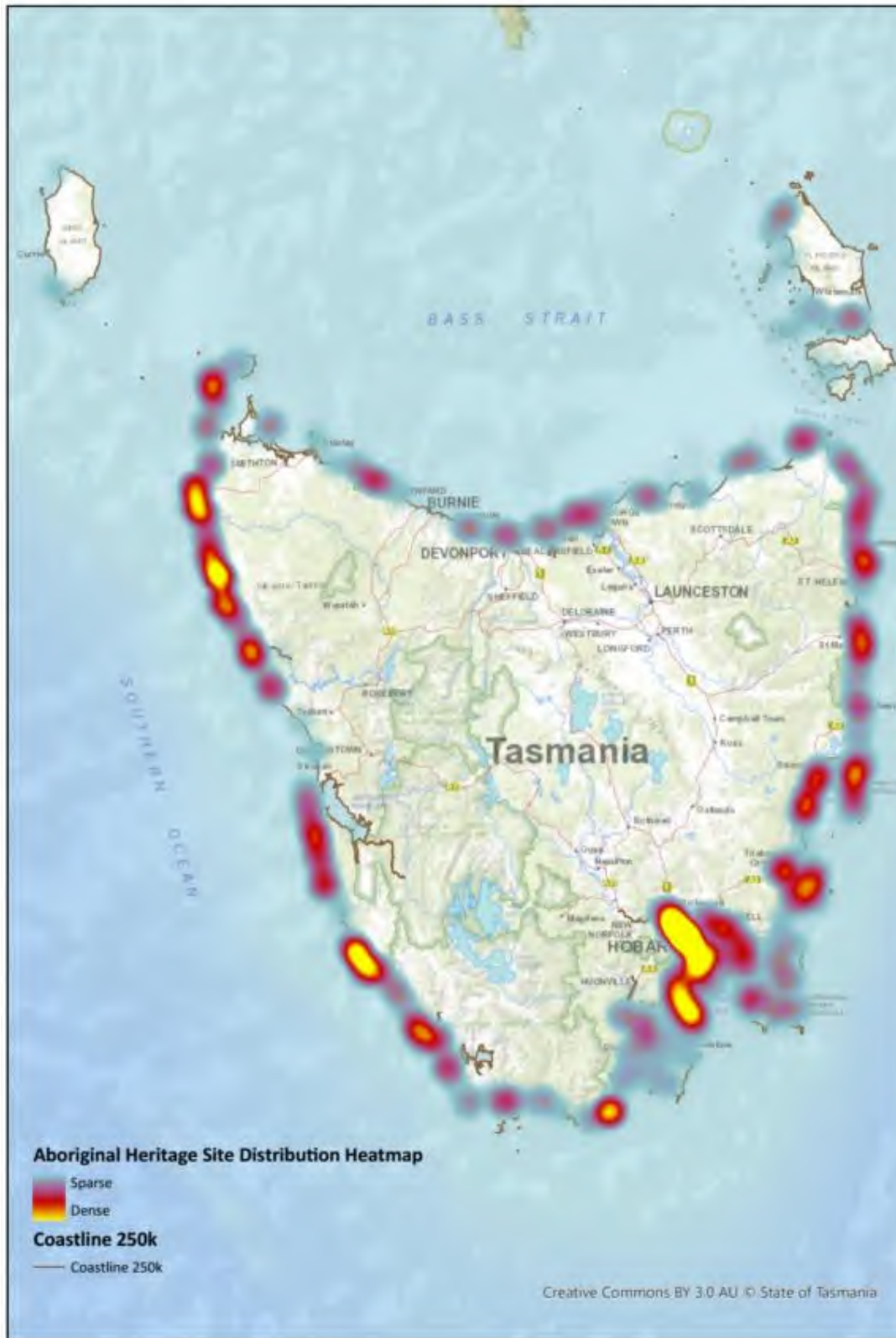


Figure 2. Aboriginal Heritage Site Distribution Heat Map.

Based on the above summary and heat map, Tasmania conforms to the below predictive model conclusions:

- Midden sites are common along the coastline, though often smaller and lower on sandy shores, and absent along rocky granite shorelines;
- Midden sites containing shell from turbo, oyster, limpet, abalone and mussel;
- Larger sites are most likely within 50cm of the coastline. The north and north-east, sites are more common on high energy coastlines;
- Sites are likely on well-drained inland areas;
- Artefact typology is often dominated by hornfels, chert, quartzite and chalcedony flakes;
- Artefact sites are more common on flat or gently inclined landscapes close to water sources;
- Geologically, areas underlain by sandstone are more favourable for persevering Aboriginal sites, than those underlain by dolerite;
- Rock shelters containing evidence of occupation are most likely within 50-100m of water;
- Rock art sites are likely on sandstone rock shelters and often executed in ochre, or engraved on coastal margins;
- There is a higher likelihood of sites within dune systems, often close to rock platforms;
- Sites that contain spongolite stone artefacts will not predate 2,500BP.

3.3. When Europeans first arrived on the shores of the coral and sand dominated Bassian island of King Island, no Aboriginal people were recorded as present. Though much interest about the island's archaeology existed within the European archaeology community it wouldn't be until the 1980s and 1990s that archaeologists such as Robyn Sim and Rhys Jones would make important contributions to understandings of past human occupation. This research mapped a sporadic history of human occupation ranging from 14,000 BP to as recently as recently 1,100 BP (Sim 1991). Archaeology includes human skeletal remains, shells middens and faunal deposits, suggesting a community who lived on the elevated plain before abandoning it following rising sea levels. More recent archaeology at the island is accounted for by nearby Hunter Island people who may have been accidentally windblown to the Island during sea faring journeys at 1,100 BP (Sim 1994). In addition to this, more recent European and Aboriginal occupation of King Island is attributed to European sealers who arrived at the island with Aboriginal women, possibly kidnapped Palawa/Pakana, Bunurong, Ngarrindjeri women during the early nineteenth-century. It is noteworthy that most sites recorded by Sim and Jones occur on the northern, southern, and western coastline of King Island along a variety of landforms, including new aeolian

dunes (Sim 1990). More broadly, the Palawa/Pakana were noted for creating durable and waterproof containers of sea-kelp threaded and dried to shape on wooden handles. In addition, shells were collected and worn as adornment. Throughout southeastern Australia, reports of seaweed use include for cultural and ceremonial activity, medicine, clothing, food, fishing, and domestic/shelter uses (Thurstan et. al 2018). The Wadawurrung, for example, used “pink seaweed” as a poultice for jellyfish stings (Lane 1980). This cultural practice may have extended to Aboriginal People who occupied King Island. New South Wales

The archaeology of this south coast of NSW has been well documented through compliance-based assessments associated with commercial and residential development, mining / quarrying and associated infrastructure. In the last thirty years, thousands of Aboriginal sites have been recorded, building up a significant database on the archaeology of the region.

Over the past forty years, archaeological studies have generally focused on specific landforms of the region, most notably the plateau and landforms along the coastal fringe. This is due to academic interest in art and shelter sites on the plateau, and midden and shelter sites on the coast. Other studies include a prevalence of impact assessment for mine sites on the plateau and residential development along the coastal plain.

Early predictions about the spatial patterning of Aboriginal sites in the Illawarra region were constrained by the lack of archaeological research previously undertaken but identified that proximity to water and other resources was an important consideration in site patterning. A desktop-based study of the Illawarra region by Sefton (1981) determined that middens, archaeological deposits, surface campsites and burials were likely to occur in the coastal zone of the Illawarra, including Lake Illawarra and its catchment. A greater density of sites was predicted to occur in the coastal region than in the rugged foothills of the Great Divide.

Overall, regional assessments have identified that the general level of archaeological investigations throughout the region is relatively limited and has been focussed on known sites rather than the investigation of subsurface archaeological resource of the area (Therin 2003:22). Investigation has also been focused on the landforms of the immediate coastal plain, with the archaeology of the foothills and land inland less well known. Investigation has also been overwhelmingly focussed on alluvial landforms, with streams the focus of test excavation within this region.

Aboriginal stone artefacts are an important source of archaeological information because stone is preserved for long periods of time whereas organic materials such as bone, shell, wood, and plant fibres decay. Stone artefacts provide valuable information about technology, economy, cultural change through time, and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as carbon dating cannot be applied. Based on direct dating of excavated sequences, a general pattern of change in the appearance of stone artefact assemblages in south-east Australia through time has been developed. Changes in the appearance and disappearance of different artefact types through time, and of changing frequencies of production of artefact types or use of different materials, have been termed the 'Eastern Regional Sequence' (ERS). This sequence of change through time was first proposed by McCarthy (1976).

The sequence is generally depicted as having four distinct phases of the ERS: the Pre-Bondaian (or Capertian), Early Bondaian, Middle Bondaian, and Late Bondaian (or Eloueran):

- Assemblages of stone artefacts during the **Pre-Bondaian (Capertian)** period have higher proportions of artefacts made from fine-grained materials such as indurated mudstone, silicified tuff, or chert. Some Pre-Bondaian assemblages are dominated by silcrete, however, presumably because access to fine-grained materials was problematic (White 2018). Edge ground artefacts are absent, and backed artefacts are absent (McDonald 2008) or rare (Hiscock and Attenbrow 2005). Recognising Pre-Bondaian assemblages is problematic, as the artefacts present in these assemblages are also present during all other periods (Lampert 1971).
- In the **Early Bondaian** phase, fine-grained materials become less abundant in assemblages, with increasing proportions of silcrete artefacts. Bipolar flaking of cores becomes more common, though this varies between sites and on some sites, it remains rare (McDonald 2008; White 2018). Backed artefacts appear in assemblages.
- In the **Middle Bondaian**, backed artefacts are more abundant in assemblages than during any other phase. Edge-ground artefacts appear in assemblages for the first time but are relatively rare (Attenbrow 2004, 73). Silcrete usually makes up a higher proportion of assemblages than in earlier periods (White 2018).
- In the **Late Bondaian**, backed artefact production becomes rare or absent in assemblages. Bipolar flaking of cores is more frequent than in any preceding phase. Edge-ground artefacts are more abundant than in the Middle Bondaian (Attenbrow 2004; McDonald 2008). Quartz usually makes up a higher proportion of assemblages than in any preceding phase.

Changes in the frequency of material usage on sites is likely to be regionally specific, and not changing across time in the same way in all parts of the region. Availability of silcrete and fine-grained materials is dependent upon the exposure of source areas. Groups that were close to an exposure of silcrete, for example, would be likely to exploit that source, even if they were living during a time where fine-grained materials or quartz were more commonly utilised across the region overall.

The time periods that the different phases span is the subject of disagreement between researchers. McDonald (2008) depicts the Pre-Bondaian continuing until 8,000 years ago, while Kohen (1986) depicts it continuing until 4,000 years ago. McDonald's Early Bondaian spans from 8,000 to 4,000 years ago, while Kohen's spans from 4,000 to 3,000 years ago. Both researchers depict the Middle Bondaian stretching between the end of the Early Bondaian until 1,000 years ago, and the Late Bondaian continuing from 1,000 years ago up until European contact. Much of this ambiguity in time periods results from the imprecision of radiocarbon or luminescence dating of different sites, and differences between researchers in deciding whether to assign certain sites to certain phases (White 2018).

The depiction of change occurring in phases creates the impression that change was sudden and occurs in punctuated events in time. It is more likely that many of the changes in the sequence occurred gradually through time (Hiscock and Attenbrow 2005). If changes were gradual, then the boundaries between phases should be thought of as 'fuzzy' lines rather than specific points in time.

The artefacts that are most diagnostic of particular periods in time are edge-ground axes and backed artefacts. Ground-edge axes are restricted to northern Australia until 3,500–4,000 years ago (Hiscock 2008, 105), at which point they spread across the whole continent, excluding Tasmania. After this point, they continue until European contact. Backed artefacts first appear in the archaeological record around 15,000 years ago, in northern Queensland, at the sites of Walkunder Arch (Campbell 1982) and OLH (Slack et al. 2004). They are rare in the archaeological record until the mid-Holocene (4,000–5,000 years ago). In the Illawarra region, the period in which backed artefacts proliferated is between 3,500 and 2,200 years ago (Hiscock 2001, 2008). After this period, they become rare in most assemblages.

The south coast landscape in the Pleistocene period was significantly different to its present form. Between ca.15,000 to 25,000 BP, the sea level was approximately 110-130 m lower, and the coastline was further to the east by between 10km to 40km. The sea level rose over the late Pleistocene and early Holocene periods and attained its present level around 8,000 years ago. Sea levels increased around 1.5 m between 6,000 and 4,000 BP before returning to present day levels, although evidence suggests this rise could have been short lived and as late as 2,000 years (Sloss et al. 2007; Switzer et al. 2009; Lewis et al. 2008). Archaeological sites that were on the coast during the Pleistocene period are therefore presently submerged. The Pleistocene sites that are located along the present coastline were originally inland sites, at a similar distance to the coastline as the highlands/tablelands area.

Archaeological sites dating to the Holocene period, and particularly the late Holocene (the last 5,000 years), are more frequently identified in the coastal region. This is thought to reflect an intensification of occupation in the area during the Holocene, but also greater survivability of these sites. There appears to have been a preference for the occupation of the coastal zone in this period, possibly due to a greater reliance on marine resources through increasing populations, territoriality, and greater climatic variability.

Absolute dating of archaeological deposits has provided much more accurate ages for sites along the coast. Evidence of Pleistocene occupation was identified at Bass Point, dating to 17,000 years ago (see Bowdler 1970 and Hughes 1977). Archaeological deposits at Burrill Lake, near Ulladulla, have also been dated to this period, about 20,000 years ago (Sefton 1981). Archaeological deposits indicate inland occupation at the current coastline and also provide evidence for repeated and more intense occupation throughout the Holocene.

Excavation of midden sites at Tallawarra (Langendoen 1971) and Hooka Point (Emmerson 1973), on the western and northern foreshores of Lake Illawarra, identified dense midden materials with dates of up to c. 4 ka. Although sites have been found along the foot of the escarpment, these tend to be small in size, and ephemeral in nature (Haglund 1983). The stabilisation of current sea levels around 6,000 BP implies that the coastal sites pre-dating this time are submerged. Radiocarbon dates for midden material along the south coast of NSW appear to be dominated by Holocene period occupation around 3,000 BP. There is potential that this is a result of the conservation of younger sites, coupled with the selection of sites identified and investigated.

The distribution, density, and size of sites is largely dependent on environmental context. For instance, middens are found near marine, estuarine, and less often freshwater bodies; rock shelters are only found in areas of exposed sandstone escarpment; and grinding grooves are found in areas of exposed flat beds of sandstone.

In some areas, midden sites are over 2km from water edge. This is most likely due to the temporal movement of occupation sites due to oscillating sea levels around the mid Holocene period, and prior to sea levels lowering around 7,000 BP.

Overwhelmingly, the literature supports a coastal occupation model of diverse resource exploitation. Desktop review suggests that Aboriginal occupation of coastal environments was driven by access to a mosaic of environments. Specifically, access to both littoral and hinterland food resources in proximity to fresh water (both fresh-water swamp, wetlands, and perennial/non-perennial watercourses) appears to be the main driver of Aboriginal site patterning within this region. Ancestral remains may also be present in coastal dune systems and alluvial deposits further inland.

Investigations across coast have produced a range of site types which have been related to a variety of environmental factors including distance to freshwater and/or wetlands / swamps, elevation, slope, and distance to other resource zones.

Conclusions relating to predictive modelling in New South Wales include:

- Sites on the coastal fringe are most likely to be Holocene-period shell and artefact site types, with large numbers of middens and artefact scatters, particularly in close proximity to the coast, and adjacent to freshwater swamps.
- Sites within the coastal plain, often present within and extending beyond dune systems, are likely to be artefact sites, with Holocene period assemblages found in higher densities adjacent to primarily perennial waterways and swamps.
- Sites further inland have higher potential for rock shelters and rock art sites, especially in areas of large sandstone overhangs and outcrops. Rock shelter sites also have potential for both surface and subsurface occupation deposits, sometimes from multiple phases of occupation. Evidence of Pleistocene occupation is uncommon in the region; however, it has been identified in subsurface occupation deposits in rock shelters.
- Evidence of occupation is most likely within close proximity to water courses, especially major waterways. Evidence of occupation is also likely within proximity to wetlands and swamps, especially in the coastal plains. Most favourable locations for occupation adjacent to water are on elevated landforms within 100 m of the resource zone, often in well-drained locations. Archaeological material is also present beyond the immediate creek surrounds in decreasing artefact densities. There may be concentrations of sites occurring on ridge tops and crests that are associated with pathways through the landscape, like the top of the Escarpment.
- Subsurface archaeological deposits are often recovered in areas where no visible surface archaeological remains are evident, which places importance on a comprehensive predictive model.
- Artefact sites across the regional study area tend to consist of assemblages dominated by silcrete and quartz, with IMTC, chert, quartzite and volcanic material also utilised for artefact manufacture. Bipolar artefact reduction is commonly evidenced in quartz, and to a lesser extent, silcrete and chert. Backed artefacts have been identified, but in low densities suggesting a date range of 5,000-1,600 BP.
- There is the potential for burials primarily in dune systems, and in alluvium along waterways further inland. This is due to the preservation afforded by the alluvium/dune bodies in both contexts. Burials could also be located within rock shelters in the sandstone country, however evidence of this is uncommon.

3.4. South Australia

The study area for this section is considered the “east” of South Australia and captures the South Australia/Victoria border west to Cape Jervis including Kangaroo Island. The Register of Aboriginal Sites and Objects is a closed database, available only by qualification and application (Taa Wika).

Ethnographic records of Aboriginal culture (intangible and tangible) within the European tradition of anthropology commences as early as South Australian colonisation. In a pursuit to record and understand Indigenous culture and people for the purpose of colonisation, the Imperial project documented cultural heritage (archaeology) termed “humane colonisation”. With the arrival of the first British emigrant ships documentation of intangible and tangible cultural heritage of the Kurna and Ngarrindjeri People commenced. Owing to the selected site of Adelaide, this began along the coastline with non-trained settler-colonists such as surgeon Dr. William Wyatt, also Protector of Aborigines (1837), missionaries such as Rev. Meyer and Taplin (1867). The tradition progressed into a science into the early twentieth century with anthropologists such as Radcliffe-Brown (1918) and Norman Tindale. Knowledge was largely shared by Elders such as Kurna Elder Kadlitpinna, Ngarrindjeri Elder Uncle James Unaipon and Putjialku to name a few and recorded by Europeans through Euro-centric views which lacked a comprehensive understanding of culture (Berndt, 1993). Traditional Owners played an important role in understanding occupation of the South Australian coastal region. For example, Ngarrindjeri Elders described and illustrated implements such as bone-tipped multi-pronged fishing spears, spear-thrower pegs and various ‘hooking’ objects for the Lower Lakes and at times, have contradicted archaeological findings such as fishing traditions along the Lower Murray and coastal region in relation to the use of fishhooks (for more see Gerritsen, 1997).

Between 1925 and 1928 formal investigations of the Murray commenced. Harold Sheard and Charles Mountford, personnel of the South Australia Museum, undertook a survey of the Lower Murray region between Blanchetown southward to Mannum, covering approximately 10-kilometres. The survey documented rock art, shelters, and tools as well as the cultural burial place of a child within a limestone cave. In 1929, anthropologists Norman Tindale and Herbert Hale, also personnel from the South Australia Museum, expanded on Mountford and Sheard’s work. The pair excavated the region with a focus on Ngaungngaut (Devon Downs) and Tartanga, excavating 6-metres into a rock deposit exposing layers of faunal remains, including those of Tasmanian Devil, as well as stone and bone tools (Mulvaney, 1964; Tindale, 1930). The pair pioneered a method of archaeology testing common place among archaeologists today known as systematic stratigraphic investigation, an excavation method in which the strata is systematically excavated, and findings recorded and analysed according to their location within these layers. This excavation is considered the beginnings of formal archaeological assessment in South Australia and remains one of the most influential projects in Australian archaeological history. Tindale would survey and excavate throughout South Australia. Tindale is also credited with identifying a coastal source of ochre located at Ochre Cove, south of Point Noarlunga (Mulvaney, 1964).

In 1952, Mountford returned to Fromm's Landing with students from the University of Adelaide. Among the excavation results were additional shelters at the Fromm's site, as well as another burial place which was that of a baby wrapped in kangaroo skin (Price, 1952). Between 1956 and 1963 John Mulvaney joined Mountford to further investigate the region. Mulvaney's analysis of Tungawa revealed hundreds of stone and bone tools, ochre, hearths, and in line with Tindale's methodology, noteworthy shifts in the stratigraphy such as the absence of faunal bones in upper layers compared to lower layers. Mulvaney employed a typology identified cultural phases to strata, also pioneered by Tindale, however, this typology is now obsolete. Artefacts included stone tools of quartz, chert, jasper with faunal remains of tortoises, shellfish, fish, and kangaroo. This decade is considered the most active in archaeological research and Mulvaney's work in the region one of the most significant archaeological projects undertaken in Australia. Billy Griffith's described it "as catalyst for research and marked the dawn of a new era for Australian Aboriginal archaeology" (Griffiths, 2017).

Archaeological assessments of the Lower Murray continued into the late 1960s. In 1968 Graeme Pretty (also of the South Australia Museum) excavated a sand dune at Roonka (Pretty, 1977). Pretty's finding consisted of hundreds of burials with the site dating to 8,000 BP. In 2008 Ngarrindjeri man and archaeologist Dr Chris Wilson, developed new archaeological evidence of Ngarrindjeri occupation in South Australia's Lower Murray region (75-kilometres from the coast). In collaboration with the Ngarrindjeri community, Wilson excavated Murrawong as part of the Lower Murray Archaeological Project, dating occupation in the region to 8,500 BP (the Lower Murray River developed around 7,000 BP) (ABC, 2008). Bone artefacts from Murrawong suggest a variety of objects and functions, including awls; projectile points for terrestrial and aquatic hunting; fishing gorges; needles and fasteners for clothing; needles and spikes used in conjunction with fibre for making nets, baskets, bags and traps; as tools for use in the secondary or pressure flaking of stone points; and for cultural purposes (Wilson, 2021). Wilson's research also uncovered cod bones that suggest a length of 2.2-metres, dating to 5,000 BP.

Ngarrindjeri Country extends inland from the boundary of the Lower Murray region to Lake Alexandria east along the coastline to capture Coorong or Kurangk (Narrow Neck), a highly fertile, lagoon ecosystem stretching 156-kilometres bound by a non-vegetated and vegetated sandbar. In 1981 Dr Roger Luebber undertook research at the Coorong and concluded that this area of coastline represented the largest, most extensive evidence of Aboriginal occupation of the region and one of the continent's most populated region at the time of colonial contact. Among his artefactual finds was the excavation of the oldest wooden boomerang dating to 10,000 years BP and burials along the dunes at the lower lakes (Luebber, 1981). With Mulvaney and Tindale, this research is considered one of the most influential of archaeological excavations of Australian Aboriginal archaeology. Dr Luebber's research made significant contributions to broader understandings of human occupation in Australia, as well as a lasting impact on understandings of Aboriginal occupation in South Australia. During the 2008 droughts, hundreds of burials became exposed. Also of significance along the coastline are the limestone formations, including caves. In 1986, David Frankel excavated Koongine Cave which is situated in a limestone ridge about 4-kilometres from the present coastline.

Results of the excavation dated occupation as early as 10,000 BP. Frankel also noted that over the course of approximately 1,500 years up to two metres of varied sediments were deposited, rich in artefacts. After this time, the cave went unused until the last millennium (Frankel, 1986).

Anthropogenic intervention, such as irrigation and climate change, continue to impact aboriginal heritage along the South Australian coastline. For example, prior to European settlement, Lakes Alexandrina and Albert at the terminus of the river Murray was predominately fresh, with river water discharging to sea and keeping the Mouth clear (Yaraldi people). Since 1900 and the introduction of irrigation in this region, saltwater intrusion has significantly increased as the freshwater can no longer hold back saltwater intrusions with impacts to ecology and freshwater fishing practices (Sim, 2004).

The investigations in South Australia conform to the earlier predictive modelling conclusions identified within Victoria:

- Artefact sites and occupation sites are likely in areas close to water sources, often also proximal to other resource zones such as wetlands, swamps and the coastline.
- Larger surface scatters are likely near perennial water supplies and frequently found in sandy environments along the margins of swamps, rivers and lakes, or are located on or adjacent to areas inundated during winter.
- Mounds and middens are interchangeable in terms of site function, with middens occurring along the coastal margin and mounds occurring inland.
- Length of occupancy, seasonal scheduling and size of campsites directly relate to local hydrology and food resource potential of particular locations.
- Statistical analysis confirms that mounds and lithic scatters tend to occur in clusters or in close proximity, often less than 1 km apart.
- Few campsites are located on treeless plains away from reliable water resources.

4. REGISTERED HERITAGE PLACES

The primary legislative instruments for the protection and management of Aboriginal cultural heritage in Victoria are the Aboriginal Heritage Act 2006 (Vic) and the Aboriginal Heritage Regulations 2018 (Vic). First Peoples – State Relations (FP-SR) provides advice to the Victorian Government on Aboriginal policy and planning, including protecting Aboriginal cultural heritage by administering the Act.

The Victorian Aboriginal Heritage Register (VAHR) was established by the Act as an important administrative tool for the management of Aboriginal cultural heritage. The VAHR, is administered by FP-SR, and holds the details of all known Aboriginal cultural heritage places and objects within Victoria, including their location, description and condition.

The VAHR records places of cultural heritage significance to the Aboriginal people of Victoria for archaeological, anthropological, historical (spanning both before and after European colonisation, and including contemporary places), scientific, social or spiritual significance, as defined in the Act. Inclusion on the VAHR is not based on a system of significance grading and all recorded sites are protected under the Act. It should be recognised that the Act protects all Aboriginal cultural heritage places and objects whether they are known and recorded on the register or not.

Biosis undertook a search of the Victorian Aboriginal Heritage Register (VAHR) in December 2022, which spanned much of the Victorian coastline. The search returned results dominated by shell middens, artefact scatters, low density artefact distributions (LDADs), and small quantities of other place types. The results were analysed on a macro scale, by Traditional Owner area, which returned further nuances in the VAHR data.

NOPSEMA provided feedback on this approach, indicating that searches of the New South Wales, South Australian and Tasmanian databases should also be undertaken. The data output from these different systems is varied, with place types varying significantly across the EMBA region, as well as state legislation having varied approval for places within these states.

Given much of the EMBA is coastal to Victoria, this assessment will utilise a second VAHR search, and use the results to inform a terrestrial predictive model for all onshore areas, which can then be utilised offshore once a submerged landscape assessment is completed.

The Aboriginal Cultural Heritage Register and Information Service (ACHRIS) is an online tool that is used to access the VAHR. A request for access to the VAHR was submitted via ACHRIS on 29 May 2024 and access number 13616 was provided. A total of 2,176 Aboriginal places are registered in the onshore model area, with 9 components excluding object collections. These components include:

- 1388 shell middens;
- 527 artefact scatters;

- 116 earth features;
- 94 Low Density Artefact Distributions (LDADs);
- 18 Aboriginal ancestral remains (Burial);
- 10 stone features;
- 4 quarries;
- 3 Aboriginal Historical places; and,
- 1 Aboriginal ancestral remains (reinterment).

A review of the location of registered Aboriginal cultural heritage places in the onshore model area provides additional information regarding the regional Aboriginal Place patterning identified in the above literature. Aboriginal cultural heritage places within the onshore model area are shown in Figure 3.

Where Aboriginal places have been located and registered is dependent upon several factors, most strongly the location and comprehensiveness of archaeological research undertaken. In addition, historical differences in registration processes and understandings of the extent of Aboriginal places will influence how Places recorded in different decades might be compared against each other. Because of these factors, amongst others, registered Aboriginal place patterning should not be read uncritically as representing the distribution of all pre-contact Aboriginal places in the onshore model area. However, statistical analysis can indicate the likelihood that the patterns identified the archaeological research above are applicable in the development of a terrestrial predictive model.

The distribution of places within the onshore model area is shown in Figure 3, below, and the number of Places per registration category are shown in Table 2, below. Stone artefacts in the form of shell middens (n=1388) and artefact scatter and low-density artefact distribution (LDAD) components (total n = 621) make up a significant percentage of Aboriginal places in the onshore model area. This is common in the majority of coastal Victoria, where shell middens are common and stone artefacts make up the bulk of the archaeological record. As noted in the literature above, there is also a significant number of earth mounds (n = 116), and stone features (n=10) present in the onshore model area.

To provide additional support to the predictive models developed in the literature above, we have plotted the location of all primary grid co-ordinates (PGCs) of registered Aboriginal places in relation to the geomorphological landscape² and closest potable water sources³, as available through Data Vic. The average distance of shell middens to the coastline has also been calculated.

-
- ² Tier 1 to Tier 3 of the Victorian Geomorphology Framework, as derived from 'Geomorphology of Victoria'.
 - ³ Distance to potable water source is determined by the distance between the primary grid co-ordinate of the registered Aboriginal place and the centreline of the nearest river or creek. Where the nearest watersource is a lake (such as sites around Lake Condah or Bridgewater Lakes), we

There are limitations to the information that can be derived through such mapping. The finest grained geomorphology data (GMU Tier 3) has a scale of 1:100,000 to 500,000 and as such can only be seen as an approximation of actual ground conditions. A detailed assessment of all reported environmental contexts for all Aboriginal places is not within the scope of this report, nor, unfortunately, is such data available for all places via ACHRIS. The water source data from DataVic is also limited in that distance calculations can only be made to the centreline of the nearest mapped contemporary watercourse. This data also does not include previous watercourses, ephemeral soaks or other locations of temporary potable water, all of which would have had a bearing on the actual distance of the Aboriginal places to water during the lifetime of their use. In addition, while PGCs have been plotted as the proxy for the Aboriginal place, some place extents may extend for tens if not hundreds of square metres, and the PGCs are not necessarily the point closest to or furthest from the water source.

Further to this, calculating the *number* of registered places does not necessarily reflect the intra-site variability between the places; an artefact scatter containing thousands of artefacts is weighted the same as an LDAD potentially containing only one artefact according to this model. An additional issue is that until 2017, all stone artefact occurrences were considered 'artefact scatters', with LDADs only being made available as a registration category from that year. To avoid conflation as much as possible, this analysis considers artefact scatters and LDADs separately.

As noted above, Aboriginal place patterning in the study area will be (at least partially) a result of where archaeological research has taken place and the intensity of the research program. The predictive power of this analysis is restrained by these limitations. However, for the purpose of this report, these calculations can provide a supplementary line of evidence towards the development of a terrestrial (and subsequently a submerged landscape) predictive model.

have created a polygon tracing the boundaries of the lake and have measured the distance from the boundary closest to the site.



Figure 3. Registered Aboriginal Places within the onshore model area.

Table 2. Aboriginal cultural heritage place components in the onshore model area

• Place component description	• Number in onshore model area
Aboriginal Ancestral Remains (Burial)	18
Aboriginal Ancestral Remains (Reinterment)	1
Aboriginal Historical Place	3
Artefact Scatter	527
Earth Feature	116
Low Density Artefact Distribution	94
Object Collection	15
Quarry	4
Shell Midden	1388
Stone Feature	10
Grand Total	2176

5. ANALYSIS OF KEY PREDICTIVE FACTORS

5.1. Distribution of Aboriginal place components

A study of Aboriginal place patterning is typically conducted over an area that includes a variety of landscapes, and proximity to potable water sources and a variety of resources are usually significant predictive factors of Aboriginal places. However, due to the unique coverage of the onshore model area, which incorporates landscapes within only 100 metres of the coastline, and the predominance of shell middens in the makeup of Aboriginal place components, this study requires a different approach. The limitation to 100 metres is relevant, however, to ensure that only archaeological places and potential impacts are considered in the model. Due to the EMBA including potential impacts from worst-case hydrocarbon spill modelling, it is extremely unlikely that archaeology will be affected beyond the wave and immediate coastal effects of deposited hydrocarbons.

This investigation of Aboriginal place patterning will primarily rely on differences in the density of Aboriginal places within different geomorphological units along the coastline of Victoria. This analysis will help to determine which geomorphological landscapes were targeted more intensely, presumably for access to coastal resources. Furthermore, these results can be used to help estimate and predict the distribution and density of Aboriginal place types and culturally sensitive landscapes along the coastlines of Tasmania, NSW, and South Australia, within the entire EMBA and can be used as a predictive tool in response to any required action.

The following geomorphological, topographical, hydrological; and coastal data sets from DEECA and Geoscience Australia are used to describe the setting of each Aboriginal place within the Onshore model area:

- Geomorphological Unit (GMU), Tier 2;
- Victorian digital elevation model (10 metres);
- Inundation prone areas, lakes, swamps and wetlands; and
- Australian Coastal Geomorphic and Stability Mapping.

5.1.1. Distribution of Aboriginal place components by geographical features

Table 3 provides a breakdown of all registered Aboriginal place types by the Tier 2 units of the Victorian Geomorphology Framework, the descriptions of which are included in

Table 4. The total area of each geomorphological Tier 2 unit is included and was used to calculate the density of the total number of Aboriginal places per Tier 2 unit. Additionally, the density of shell middens (N=1,388), artefact scatters (N=527), and all other component types (N=261) are shown in Figure 4. This data indicates that some geomorphological units have significantly high or low densities of Aboriginal places and can be used to predict archaeological sensitivity. Most apparent is both the high number and density of Aboriginal places in GMU 8.5. Additionally, high densities of all place types are found in GMU 1.3. By contrast, GMUs 6.1, 7.1, 8.6, and 8.7, are characterised by comparatively low densities of Aboriginal places.

Table 3. Aboriginal places by geomorphological units.

GMU T2	Area of GMU (km ²)	Number	Density (km ²)
1.3	5.90	190	32.18
1.4	1.20	30	24.92
3.1	13.75	180	13.09
3.2	3.46	70	20.25
3.3	19.99	226	11.31
6.1	3.01	14	4.65
6.2	22.77	232	10.19
7.1	13.93	23	1.65
7.2	2.28	25	10.96
7.3	5.07	73	14.40
8.1	4.80	74	15.43
8.2	1.00	14	14.04
8.4	63.36	472	7.45
8.5	21.88	479	21.89
8.6	42.15	42	1.00
8.7	3.12	13	4.17
Wetland	0.22	3	13.76

Table 4. Description of GMU T2 units.

GMU T2	GMU T2 description
1.3	Landscapes below 500 m of low relief
1.4	Dissected landscapes at a range of elevations
3.1	High relief, (moderate elevation, about 250 600 m) Otway, Strzelecki and Hoddle Ranges
3.2	Low relief (low elevation, about 100 250 m)
3.3	Very low relief (very low elevation, generally less than 100 m)
6.1	Volcanic plains
6.2	Sedimentary plains (Plains on unconsolidated (sedimentary) deposits)
7.1	Central sunklands
7.2	Southeastern riverine plains
7.3	High level terraces and fans
8.1	Active cliffs (Port Campbell)
8.2	Steep slopes with basal cliffs (Otways)
8.4	Coastal barriers (Ninety Mile Beach)
8.5	Transgressive dunes
8.6	Low coasts (wetlands, tidal reaches)
8.7	Engineered coast (Port Melbourne)
Wetland	Wetlands

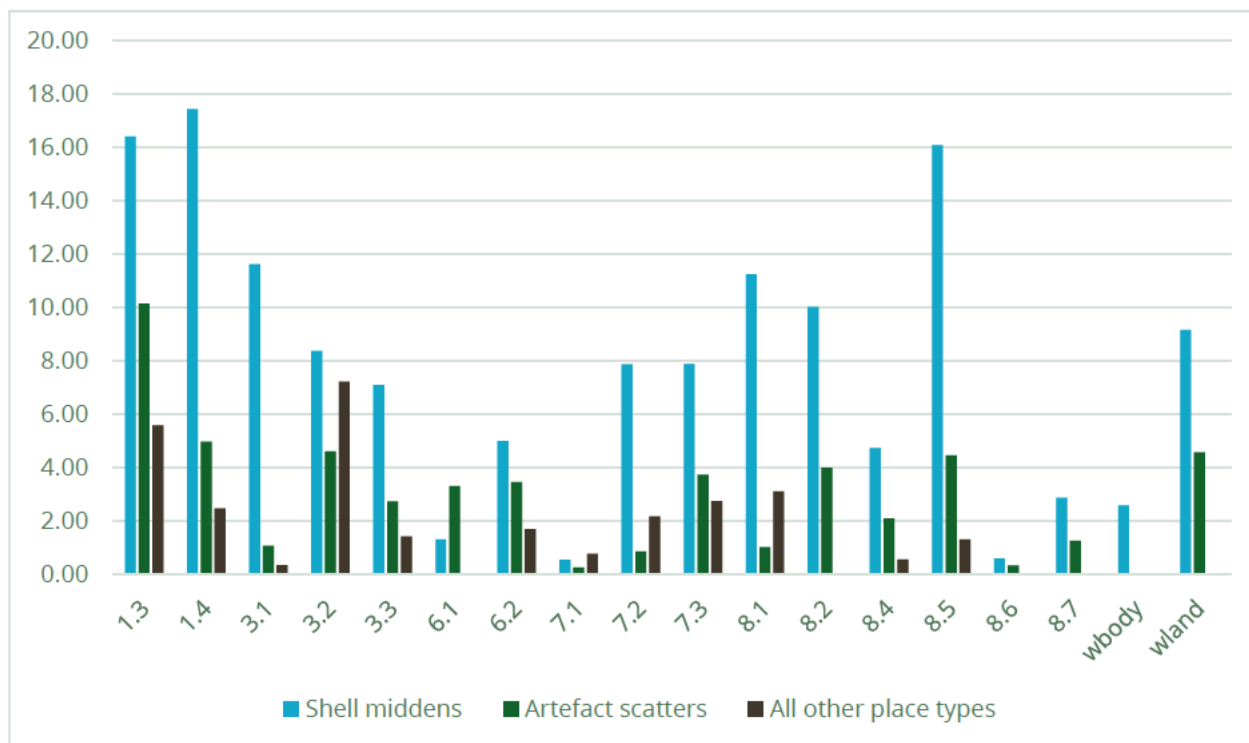


Figure 4. Density of Aboriginal places per GMU T2 unit.

In addition, the relative elevation of each Aboriginal place was calculated. Land within 100 metres of the coastline of Victoria ranges from approximately 0-85 metres elevation, and 60% (N=1,290) of Aboriginal places are located at or below 10 metres (Figure 5). Of this proportion, 122 places are located at sea level (i.e. 0 metres) or are located on offshore islands at an unknown elevation. Conversely, Aboriginal places within 100 metres of the coastline are rarely located above 30 metres elevation. Although the ethnohistorical research indicates that geomorphological landscapes and cliffs that support caves systems are likely to be places of high archaeological sensitivity, this analysis suggests that Aboriginal places are unlikely to be present on the very edges of cliffs (i.e. within 100 metres of the coastline).

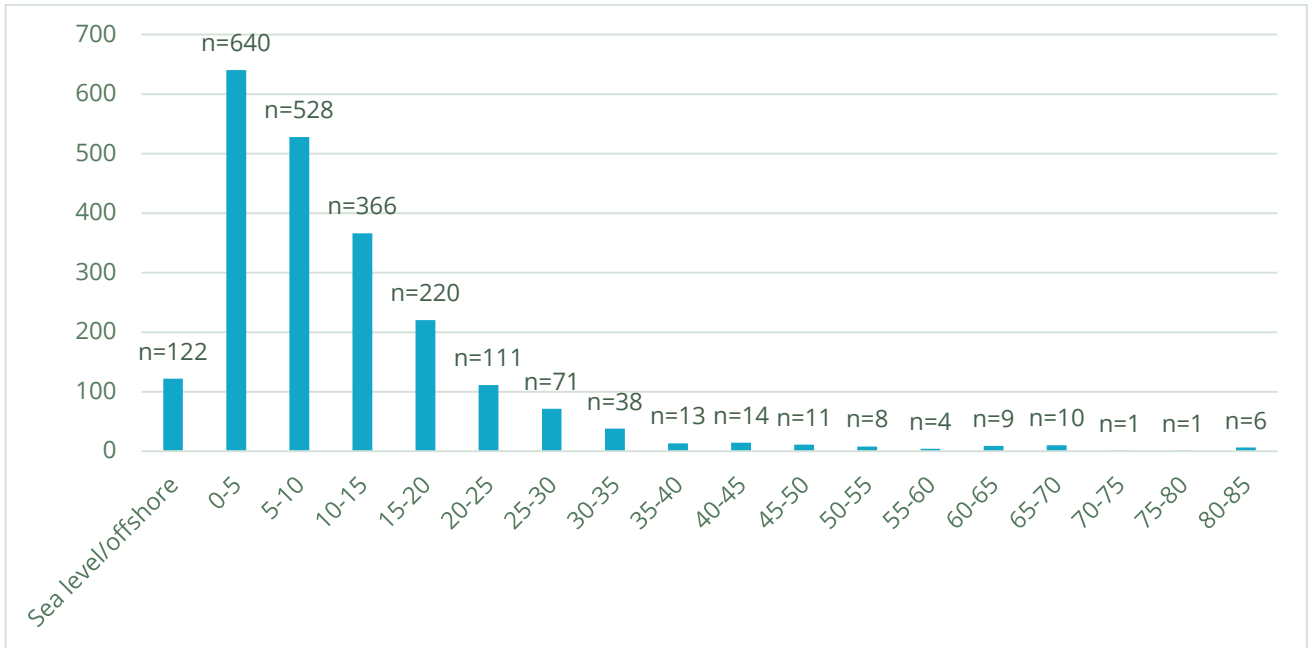


Figure 5. Number of Aboriginal places by elevation (5 metre intervals).

Ethnohistorical research also indicates that waterbodies, in particular wetlands or swamps in coastal environments, are likely to be places of high archaeological sensitivity. Consequently, the distance from all Aboriginal places within the onshore model area to the nearest natural waterbody (including lakes, wetlands, and areas prone to inundation, creeks and estuaries) was calculated (Figure 6). Although almost 20% of sites are located within 1 km of a waterbody, on average, sites are located 6.63 km from the nearest waterbody. Therefore, although places are likely to be somewhat clustered around wetlands and swamps, the distribution of registered Aboriginal places along the coastline is not strongly correlated with proximity to natural waterbodies.

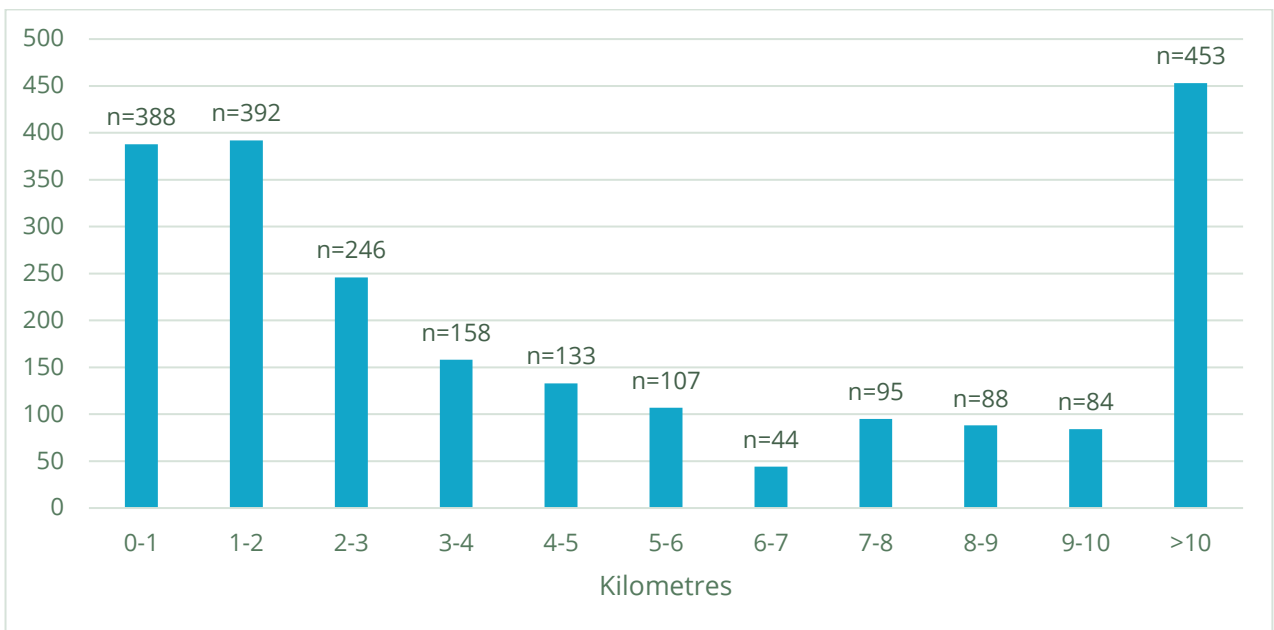


Figure 6. Distance from Aboriginal place components to nearest natural waterbody (1 km intervals).

Finally, this analysis incorporated Geoscience Australia’s Coastal Smartline report and spatial data. Their project created Smartline geomorphic mapping for the entire Australian coast and classified segments of the coast according to a variety of attributes, including a broad description of the intertidal environment. Consequently, the nearest intertidal environment to each Aboriginal place in the onshore model area was calculated (Table 5). The coastline of Victoria is dominated by sandy beaches and fine-medium sandy beaches, and unsurprisingly, high numbers and relatively high densities of Aboriginal places are located in these environments. By contrast, very low densities of Aboriginal places are in sandy tidal flats, pebble/cobble beaches, and hard bedrock shores (Table 5).

Table 5. The number and density of Aboriginal places within intertidal environments.

Description of the intertidal environment	Length (km)	N	Density (per km)
Coarse sand beach	136.32	130	0.95
Coarse sand beach, bedrock protruding	2.70	2	0.74
Fine-medium sand beach	931.87	787	0.84
Fine-medium sand beach, bedrock protruding	9.14	13	1.42
Hard bedrock shore	425.38	205	0.48
Hard rocky shore platform	1.58	4	2.53
Pebble/cobble (rock shingle) beach	48.82	19	0.39
Rocky shore (undiff)	5.59	8	1.43
Sandy beach (undiff)	887.51	850	0.96
Sandy beach with cobbles/pebbles (rock)	25.64	16	0.62
Sandy shore (undiff)	5.85	13	2.22
Sandy tidal flats	71.19	2	0.03
Sandy-mud tidal flats	614.08	5	0.01
Sandy-mud tidal flats with protruding bedrock	1.32	2	1.51
Sloping soft 'bedrock' shore	37.28	27	0.72
Soft 'bedrock' shore	102.47	39	0.38
Unclassified	59.01	39	0.66



Figure 7. Tier 2 Geomorphology within the onshore model area.



Figure 8. Intertidal description within the onshore model area.

5.2. Summary of archaeological research

The above research indicates that there are some clear predictive factors regarding the patterning of Aboriginal cultural heritage across the region. Overall, the following archaeological sensitivity conclusions are made from the archaeological review:

- The most sensitive geomorphological units for Aboriginal Place identification are landscapes below 500m of low relief, dissected landscapes and transgressive dunes;
- Land within 100m of the coastline is likely to contain Aboriginal Places, further emphasised by areas between 0-30m elevation;
- Aboriginal Place types are likely to be located within 1 km of potable water sources, with higher stream orders likely associated with more long term and more intensive use;
- Artefact scatters and low-density artefact distributions (LDADs) have greater distributions in relation to their distance to water than other Aboriginal Places, although still cluster towards potable water sources;
- Middens sites are largely influenced by their proximity to the current coastline. Former sea level stand-stills (both higher and lower than current day) would likely have led to similar depositional histories;
- Swamp and wetland margins would have been excellent resource procurement zones. Swamps and wetlands themselves have remained relatively stable for around 4000 years;
- Colonial era development will have reduced the potential for in situ Aboriginal cultural heritage.

Within the study area, along the Victorian coast, there are 2,176 registered Aboriginal places with the most common site types being shell middens, artefact scatters and LDADs. Shell middens are typically found along the coastline, whereas artefact scatters, while also being found along the coast, are varied and move inland following freshwater sources, likely to be indicative of past inland-coastal travel routes. LDADs are also typically found further inland than shell middens and artefact scatters, indicative of widespread use of the landscape in the past, rather than concentrations and repeated patterning.

In light of a review of Aboriginal places within the study area, there is a high likelihood for Aboriginal cultural heritage material to be present within the areas subject to potential impact in the extremely unlikely event of a loss of well control.

Within Tasmania, Aboriginal heritage should be expected in any area of low-lying coastal areas, shelter sites, and sources of food, water and raw materials. These coastal margins contain all Tasmanian Aboriginal site types. It is also known on the West Coast of Tasmania, that a number of rock art sites are located on the coast, many either close or in tidal margins. Large midden sites are also located very close to the water's edge, as well as some stone quarry sites within tidal margins. It has also been observed that there is evidence some submerged sites within areas of Tasmania, and these will need to be considered.

6. TERRESTRIAL SENSITIVITY MODEL

The conclusions of the above desktop review were combined with a landscape-scale spatial analysis of registered Aboriginal Places to prepare a detailed sensitivity model of place preservation and patterning. This model incorporates the physiographic and environmental setting of each registered place, and through analyses of these attributes and archaeological reasoning, applies arbitrary sensitivity scores to each element. When combined, the overlay of the sensitivity scores produces a map of combined sensitivity across the onshore model area.

Development of this Aboriginal heritage sensitivity model can be used as a foundation to predict archaeological sensitivity along the coastlines of Tasmania, NSW and South Australia, and to develop a predictive archaeological model for the submerged palaeo-landscape within the offshore exploration area to support the implementation of the Underwater Cultural Heritage component of the Cultural Heritage Protection Program as described in the Environment Plan.

6.1. Methodology and Input variables

Geophysical data sets from DEECA and Geoscience Australia were used to describe the setting of each Aboriginal Place. Distance calculations from each Aboriginal place to the nearest waterbody (lake, swamps, and areas prone to inundation), were undertaken using the GRASS v.distance function in QGIS. A spatial join was used to identify the geomorphological and environmental values or categories that each Aboriginal place was within. The sample spatial tool was used in QGIS to identify the elevation of each Aboriginal place. All values were compiled in the attribute table of the Aboriginal places dataset. Data exploration and description was done in Microsoft Excel using a Pivot Table to generate counts of all instances of an Aboriginal place within each input attribute class. The results of this analysis along with archaeological reasoning were used to devise and assign sensitivity scores to appropriate variables described in

Table 6 with scores reflecting the degree to which they predict spatial patterning of Aboriginal places.

The relevant geospatial features were dissolved into single polygons and assigned their sensitivity score. The Union geoprocessing tool in ArcMap was used to overlay two variables at a time. The tool creates new polygons for each instance where two of the input variables overlap. The field calculator is then used to sum the sensitivity score of each new polygon produced. This process is repeated until all predictive variables have been overlaid and their scores added. The final overlay is dissolved to aggregate all features with the same sensitivity score. This output is displayed in ArcMap and sensitivity scores are classified into groupings from Low to Very High.

Additionally, due to the proximity of King Island to the offshore exploration area, a terrestrial sensitivity model was developed for an onshore area, 100 metres from the coastline, on King Island. Although Tasmanian Aboriginal heritage places have not been incorporated into the place patterning analysis above, we can assume some parallel in the patterning of places along the

coastline of King Island due to proximity to coastal resources being a significant predictor more broadly of Aboriginal place patterning. A geomorphological dataset of landforms on King Island comparable to the data resolution of the Victorian GMUs is not readily available, and consequently, only the Geoscience Australia Smartline and elevation datasets were used as predictive variables.

Table 6. Sensitivity variables and scores.

Variable	Dataset	Sensitivity score
GMU 8.5	GMU Tier 2	4
GMU 1.3	GMU Tier 2	3
0-10 metres elevation	Victoria 10 metre DEM	2
GMU 3.1	GMU Tier 2	1
GMU 3.2	GMU Tier 2	1
GMU 3.3	GMU Tier 2	1
GMU 6.2	GMU Tier 2	1
GMU 7.3	GMU Tier 2	1
GMU 8.1	GMU Tier 2	1
GMU 8.4	GMU Tier 2	1
Sandy beach undiff	GA Coastal smartline	1
Fine medium sand beach	GA Coastal smartline	1

6.2. Sensitivity model outputs

The model's outputs are presented as the mapped sensitivity model of the onshore model area, including King Island, shown in Figure 9, and three extents of the model are presented in Figure 10- Figure 12. The mapped sensitivity model of the onshore model area on King Island is shown in Figure 13. The sensitivity model visualises the high archaeological sensitivity of areas of low elevation characterised by transgressive dunes (GMU 8.5).

Furthermore, the ethnohistorical research, spatial patterning analysis and sensitivity model can be used to predict the archaeological sensitivity of these types of landscapes along the coastline of Tasmania, NSW, and South Australia. For example, based on the density of 16 shell middens per square kilometre of transgressive dunes, and roughly 2 shell middens per kilometre of sandy shore on the Victorian coastline, similar environments in these states are likely to feature similar densities of Aboriginal places and be landscapes of high archaeological sensitivity.



Figure 9. Terrestrial sensitivity model of the onshore model area – included predicted (extrapolated) sensitivity outcome on King Island

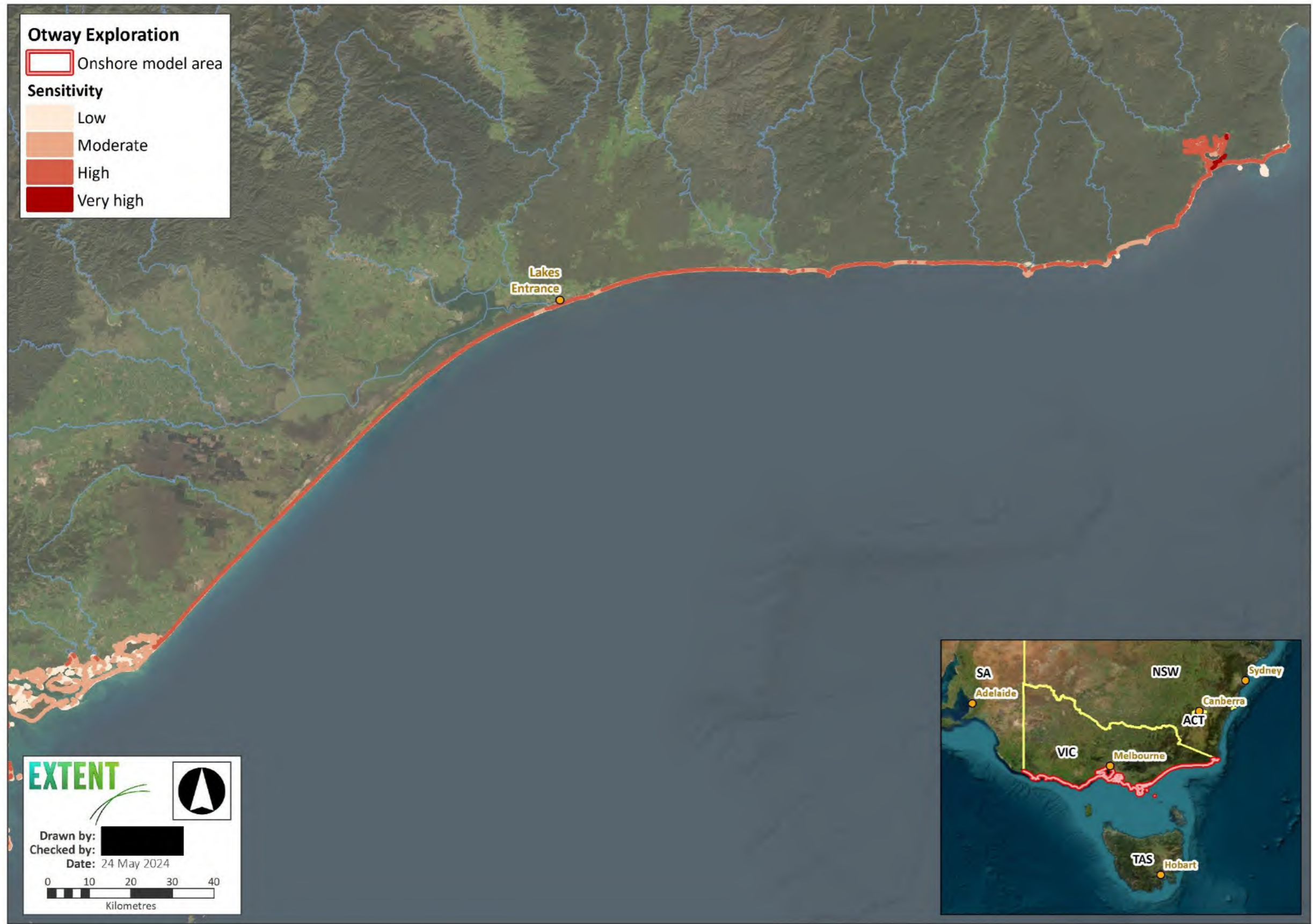


Figure 10. Terrestrial sensitivity model of the onshore model area – eastern extent.



Figure 11. Terrestrial sensitivity model of the onshore model area – central extent.



Figure 12. Terrestrial sensitivity model of the onshore model area – western extent.



Figure 13. Terrestrial sensitivity model of the onshore model area – extrapolated results on King Island.

6.3. Implications for submerged palaeolandscape assessment

The above model has been developed specifically to respond to the coastal impacts of a hydrocarbon spill and the likelihood of sites being present across the landscape in the entirety of the EMBA, as a reflection of a study commensurate with the likely impact. The model holds the most utility for predicting places of high archaeological sensitivity in onshore landscapes along the coastline of Australia. It is not the best placed for directly predicting Aboriginal place patterning and archaeological sensitivity in submerged landscapes due to the narrow extent of the onshore model area and it is likely that the submerged landscapes consist of landforms that are not just former coastlines. Therefore, to appropriately assess the archaeological sensitivity of the submerged landscape, the scale and magnitude of the onshore model needs to be refined. The model developed in future needs to be local to the area and targeted to the specific offshore operational area.

Nonetheless, the review of Aboriginal archaeology and the sensitivity model presented above does provide some relevant preliminary insight and implications for a submerged palaeolandscape assessment. It is possible to translate the primary pattern drivers of Aboriginal places from a terrestrial perspective to related topographic characteristics that may be preserved in a submerged terrestrial context. The primary archaeological drivers described by the above analysis are access to resources, primarily those associated with water. This is evidenced by the highest density of shell middens and stone artefact sites in and near dunelands and where the coastline co-occurs with estuarine environments, near water courses and wetland. Each of these landscape elements have specific topographic signatures which may be identified in a submerged landscape. Submerged landscape features that are likely to be associated with higher archaeological sensitivity may include:

- Former watercourses can be identified by infilled channels;
- Former lakes, swamps, marshes and wetlands can be identified by either or both physical depressions and sediment analysis from core samples;
- Relict coastlines may be preserved as inundated dunelands, coastal barriers and other relict coastal geomorphology of archaeological interest (depending on the inundation energies, tides, currents and whether dune features experienced cementation prior to inundation);
- Islands and stranded cliff tops can be identified by escarpment and ridgeline landforms.

The primary characteristics that may be able to be mapped with bathymetric and 3D seismic data currently available include, though are not limited to, the following features:

- Bank/shoal
- Valley (Palaeochannel)
- Escarpment
- Ridge
- Shelf
- Terrace
- Tidal sandwave/sandbank

This limited range of features presents a challenge in trying to translate the terrestrial model into something that is useful and meaningful on the seafloor. There are many site types, such as culturally modified trees, sites located on sand dunes and earth mounds that are unlikely to have survived the process of inundation. Similarly, the potential survival of stone artefact deposits and shell middens will also be heavily dependent on localised preservation conditions and the specific processes of inundation during particular periods of sea level rise and how that impacted different terrain and lithologies. The angle of slope, wave fetch, speed of inundation, site context (e.g. a protected closed site within a rock shelter or a site protected in a limestone karst void compared with an open site on a sand dune) and site density (dense shell middens that form a lime-rich cemented deposit compared with a sparse artefact scatter within loose sandy loam topsoils) will all be important factors in the potential for the survival and integrity of any submerged Aboriginal cultural deposits.

The ideal scenario would be to project the generated land-based model presented above, or a modified version of which reflects more closely the terrestrial landscape, across the seafloor. However, in the absence of the same fine grained GMU data available for the terrestrial model, the following suggestions are a starting point for development of the submerged terrestrial modelling.

The 'mappable' submerged terrain that is likely to have a higher potential for submerged Aboriginal archaeological deposits and/or culturally significant landforms may include:

- Submerged land 300m either side of the centreline of any palaeochannels or 300m from the edge features that would have been present as semi-permanent or permanent water sources such as; creeks, rivers, swamp, wetlands or lakes during the last 65,000 years;
- Any flat to gently inclined surfaces on former escarpments, cliffs or ridges, particularly on landforms that may have overlooked former coastlines or water bodies;
- Rock overhangs exposed on former sea cliffs;
- Any stony rises or eruption points that would have formed higher points on the former landscape;
- Former barrier dunes in the form of submerged ridgelines parallel to the coastline, especially where modelled to coincide with an area of former sea level standstill in the previous 40,000 years;
- Any higher land that may have formed sea stacks or islands during periods of lower sea level. These landforms may have had economic, social and/or spiritual importance in the past.

The above features are considered of relevance when assessing geophysical and geotechnical data collected during seabed surveys, as discussed below.

7. UPDATED RISK ASSESSMENT

The below risk and impact assessment has been developed based on predicted risk to cultural heritage, predicted impacts and the acceptable impact and management derived from various Country Plans concerning Sea Country.

7.1. Impact Assessment

7.1.1. Aboriginal Places in the EMBA

Aboriginal Places, especially those on the immediate shoreline of the EMBA, may be affected in the unlikely event of a hydrocarbon spill caused by a loss of well control (LOWC). Based on the predicted event of a spill, the spill area must also then extend to shore in order to affect a place. It is deemed more likely that this will happen along the Victorian coast, as it is closer than mainland Tasmania, South Australia, or New South Wales. As outlined above, for example, a sandy shore type landscape is likely to have a site density of 0.62 to 2.2 site/kilometre of coastline. A spill, therefore, may result in the fouling of the land and require clean-up. That impact and subsequent clean up, may therefore potentially affect an Aboriginal place.

Therefore, based on the cumulative nature of the potential for impact, and the sheer scale of coastline within the EMBA, the risk of impact to Aboriginal Places in a physical sense from, is extremely low.

It is possible that Aboriginal Places are in the offshore environment (within the Operational Area), however due to a lack of targeted and scientific exploration to date, combined with potential seafloor processes, as well as the extent of proposed impact being relatively small compared to the size of the former landscape, it is currently impossible to predict and measure any potential future impact. Impact is therefore further minimised by approaches to submerged landscape features more likely to contain places, and a planned response to unexpected finds.

There is **minor (2)** risk to Shell Midden sites because of the proposed exploration activity. This is due to the moderate frequency of Shell Midden Places on the immediate coastal shoreline, and the indirect impacts of hydrocarbon spill. It is considered possible that a hydrocarbon spill that impacts the coast may impact a shell midden located on a sandy beach, more likely than a rocky shore. Impacts are likely to cause partial disturbance to these places, if removal of weathered waxy material is required from the physical place/site, or if access is required through these areas and they are not clearly identified and demarcated as required in the Oil Pollution Emergency Plan (OPEP). This will cause impact to access and the fabric of the place.

There is **negligible (1)** risk of impacts to Aboriginal Historical Places, Artefact Scatters, Earth Features, Low Density Artefact Distributions, Quarries and Stone Features, or Ancestral Remains (reinterment) as a result of hydrocarbon spill. These places are less likely to be found directly on the

coastline and are less likely to be impacted by deposition of spill material, but may be impacted by spill response activities, i.e. access to/ from shorelines, if not clearly identified and demarcated as required in the OPEP. If material is deposited on these Places, there is potential for these Places to be indirectly impacted, to a minor extent, and may cause partial disturbance. It is unlikely Ancestral Remains (reinterment) has occurred at a location impacted by wave action.

There is **minor (2)** risk to Aboriginal Ancestral Remains (Burial), and rock art sites, as a result of the Otway Exploration program. The program should have minor impact on these Aboriginal Places as they are rare, however, if impact occurs the importance is increased due to potential cultural value of these places.

7.1.2. Submerged Landscape Features in the Operational Area

Submerged landscape areas expected to be of higher cultural sensitivity to the Aboriginal communities may also be impacted by the proposed exploration program. The presence of these landscape features has been investigated through a review of current data including sediment samples, high resolution bathymetry and 3D seismic data. A more detailed and responsive submerged landscape assessment, to provide information on the presence of such areas within smaller drilling areas (~2 km radius around exploration wells), will be conducted by a suitably qualified professional, after the seabed survey data has been collected.

The most sensitive submerged landscape features are considered to be the landforms most likely to be frequently utilised in the past, with the highest potential cultural (tangible and intangible) value and are more likely to have physical cultural heritage survive due to the deposits or items being predicted to be more numerous on these specific landforms. Survivability following inundation has been further assessed.

We acknowledge that all of the submerged landscape was likely to have been utilised by Aboriginal people in the past, however the intensity of use is likely to be more focused on these sensitive landforms. Any information gathered as part of sub-sea investigations (such as the results of various geophysical and geotechnical investigations), interpreted in an archaeological context by qualified professionals, is of benefit to the understanding of the submerged landscape.

Areas considered likely to be of higher sensitivity include

- Submerged land 300m either side of the centreline of any palaeochannels or 300m from the edge features that would have been present as semi-permanent or permanent water sources such as; creeks, rivers, swamp, wetlands or lakes during the last 65,000 years
- Flat to gently inclined surfaces on former escarpments, cliffs or ridges
- Rock overhangs
- Stony rises or eruption points
- Former barrier dunes
- Higher land that may have formed sea stacks or islands

There is potential for these features to be impacted, however, it is recommended that any features of high sensitivity are avoided in the first instance, thus impact is considered to be **negligible (1)**.

Should the sensitive landform be unable to be avoided, this will need to be negotiated with the Traditional Owners and be completed with as much prior scientific and cultural information gathered as possible. It is therefore likely that with these measures in place, the impact will be **minor (2)**. The size of the landform or place, compared to the size of the impact, should also be considered in regard to the potential impact compared to the potential for recovery of scientific and social information.

It is recommended that if these landscape features are encountered that the disturbance of the seabed within the operational area is minimised by siting drilling locations outside of these features, where possible in consideration of the scale and potential significance of identified features. Therefore, the assessment of impact is dependent on both the result of the survey and the ability to respond to the presence of potential features.

7.1.3. Cultural Features in the EMBA and Operational Areas

Due to the varied culture and history of Aboriginal groups, and in particular owing to various degrees of dispossession and removal from country, loss of connection, and continuation of culture, the responses of Aboriginal communities to caring for and talking about both Country and Sea Country are different throughout Australia. These individualised but community-based beliefs and values contribute to the need for a varied and responsive approach to managing cultural (tangible and intangible) values. Throughout the EMBA, and in the case of a LOWC that extends to the shoreline, tangible and intangible impacts are likely to be remote.

It is frequently raised by Aboriginal communities that ecological protection and sustainability is integral to Aboriginal cultural and contemporary values. Country Plans, such as those completed by the Gunaikurnai, Wadawurrung, Eastern Maar, and other plans such as the Nyamat Mirring Plan, highlight the importance of approaches that protect and enhance the environment, including biodiversity, manage sea level rise and address climate change impacts. Goals include managing impacts to whale and eel migration, bird and bat nesting and migration (such as the microbat, bentwing bat and orange-bellied parrot), protection of environmentally fragile resources such as seagrass and kelp fields, as well as securing habitat for threatened species such as the leafy seadragon.

Seals, or *Bithau* or *Gurnun* in Kunai (Howitt n.d.:32,115,12, 108), are noted by the Gunaikurnai as a significant species, and habitat for fur seals at Wilsons Promontory Marine National Park is identified as an important resource to be protected, particularly due to the reliance of species on both the land and sea for different life cycle stages. It is therefore considered important that programs for environmental management consider both land and marine environments, as they are interconnected and must be managed as a whole to ensure success (GLAWAC 2015:52).

If these impacts are assessed as acceptable from an ecological impact point of view – the corresponding impact to cultural heritage is likely to be the same. It is important to ensure that this impact and/or control measures are communicated in accessible plain English with appropriate visuals to the Traditional Owner groups, in an open and honest way, prior to any impact or potential impact occurring.

Otway Exploration Drilling Program Environment Plan

Rating	Environmental	Socio-economic and Cultural
C5 Severe	<p>High environmental impact.</p> <p>Catastrophic release impacting widespread areas including multiple sensitive ecosystems, fisheries, commercial users with potential for long-term population level impacts to threatened species.</p> <p>Long term impacts to sensitive habitats and multiple ecosystems with significant response over long duration (>5 years).</p> <p>Regulatory reportable, significant enforcement action.</p> <p>Beyond ConocoPhillips control, requiring international and long-term oil spill response organisation (OSRO) resources.</p>	<p>Extended or permanent loss of access and loss of operations or planned activities of titleholder and other marine and coastal users.</p> <p>Severe impact to/from key stakeholders, for example, extended impacts to commercial fishing due to public perception of contamination, damage to cultural values and sensitives.</p> <p>Requiring executive level involvement.</p> <p>Damage may be permanent.</p>
C4 Major	<p>Major environmental impact.</p> <p>Release affecting large areas including sensitive habitats, fisheries, commercial users, threatened species and culturally sensitive areas with potential for short to moderate-term population level impacts.</p> <p>Impacts mitigated though significant response that addresses ecological systems or sensitive habitats over moderate duration (<5yrs).]</p> <p>Regulatory reportable, material enforcement action.</p> <p>Beyond ConocoPhillips control, requiring OSRO resources.</p>	<p>Permanent partial restriction on access and major impact to operations or planned activities of titleholder and other marine and coastal users.</p> <p>Major impact to/from key stakeholders, impacts to commercial fishing due to public perception of contamination, disturbance to cultural values and sensitives.</p> <p>Requires senior level management involvement.</p> <p>Issue will take a significant amount of time to resolve.</p>
C3 Moderate	<p>Moderate environmental impact.</p> <p>Release affecting surrounding area, with regional impact.</p> <p>Impacts mitigated through natural processes in <1yr.</p> <p>Regulatory reportable, potential for minor enforcement action.</p> <p>Within ConocoPhillips control (in conjunction with offshore contractor and local OSRO).</p>	<p>Temporary restriction on access and moderate impact to operations or planned activities of titleholder and other marine and coastal users.</p> <p>Moderate impact to/from key stakeholders, with focused efforts with various business unit groups.</p> <p>Issue resolved in a moderate amount of time.</p>
C2 Minor	<p>Minor environmental impact.</p> <p>Minor spill to sea (minor Loss of Containment (LOC))</p> <p>Localised and temporary impact.</p> <p>Impacts mitigated through natural processes in short duration (weeks to month).</p> <p>Regulatory recordable.</p> <p>Within ConocoPhillips control (via offshore contractor).</p>	<p>Brief restriction on access and minor impact to operations of titleholder and other marine and coastal users.</p> <p>Minor impact to/from key stakeholders, with efforts of stakeholder engagement professionals.</p> <p>Issue resolved in a minimum amount of time.</p>
C1 Negligible	<p>Negligible environmental impact.</p> <p>Instantaneous contained spill or small spill to sea (less than 1 m³).</p> <p>Waste load contamination.</p> <p>No risk of environmental damage, impacts <1 month.</p> <p>Regulatory recordable.</p> <p>Within ConocoPhillips control (via offshore contractor).</p>	<p>No restriction on access and no impact on operations of titleholder and other marine and coastal users.</p> <p>Negligible impact to/from key stakeholders, with efforts of stakeholder engagement professionals.</p> <p>Issue resolved quickly.</p>

Figure 14. Otway Exploration Drilling Program Environment Plan

ConocoPhillips Risk Assessment Matrix

Risk Matrix		Consequence Severity				
		C1 (Negligible)	C2 (Minor)	C3 (Moderate)	C4 (Major)	C5 (Severe)
Likelihood	Very Likely (L5)	RR II	RR II	RR III	RR IV	RR IV
	Likely (L4)	RR I	RR II	RR III	RR III	RR IV
	Somewhat Likely (L3)	RR I	RR II	RR II	RR III	RR III
	Unlikely (L2)	RR I	RR I	RR II	RR II	RR II
	Very Unlikely (L1)	RR I	RR I	RR I	RR I	RR II
Assessing likelihood considers historical information and requires professional judgement						
Very Likely (L5)	Event is expected to occur several times during the Otway Exploration Drilling Program. Similar events have occurred within ConocoPhillips Australia's business unit.					
Likely (L4)	Event is expected to occur once during the Otway Exploration Drilling Program. Similar events have occurred multiple times within ConocoPhillips.					
Somewhat Likely (L3)	Event may occur during the Otway Exploration Drilling Program. Similar events have occurred in the oil and gas industry or once within ConocoPhillips.					
Unlikely (L2)	Event is doubtful to occur during the Otway Exploration Drilling Program. Similar event has occurred in the oil and gas industry.					
Very Unlikely (L1)	Event is considered almost impossible to occur during the Otway Exploration Drilling Program. Similar events not heard of in the oil and gas industry.					
Risk Rating						
RR IV	High	Manage risk using additional or improved risk-reducing measures with priority. Inform appropriate management level with risk assessment detail and obtain appropriate approvals per the business unit's requirements.				
RR III	Significant	Manage risk using additional or improved risk-reducing measures with priority. Inform appropriate management level with risk assessment detail and obtain appropriate approvals per the business unit's requirements.				
RR II	Medium	No additional risk-reducing measures required where controls can be verified as functional. Improvements based on lessons learned are encouraged.				
RR I	Low	No additional risk-reducing measures required. Improvements based on lessons learned are encouraged.				

Figure 15. ConocoPhillips Risk Assessment Matrix

Table 7. Identified Cultural Heritage Feature and Applied Impact Rating

Cultural Heritage Item/Feature	Risk of Impact	Degree of Impact	Type of Impact	Risk Rating	Acceptable Impact
Aboriginal Places					
Aboriginal Ancestral Remains (Burial)	Minor	Minor (Partial)	Indirect to Direct	RRI	<p>None without approval (Permit or otherwise, depending on the state in which impact occurs). Approval cannot be sought unless impact occurs.</p> <p>In the unlikely event of LOWC and weathered waxy hydrocarbons meet the shoreline clean-up of spill may impact sites/places. Clean up will require consultation and relevant approvals (per state), if a place is impacted.</p> <p>Risk Rating is Low as the event is considered Remote (Unlikely) likelihood of negligible to Minor severity.</p>
Aboriginal Ancestral Remains (Reinterment)	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Aboriginal Historical Place	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Artefact Scatter	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Earth Feature	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Low Density Artefact Distribution	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Object Collection	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Quarry	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Rock Art	Minor	Minor (Partial)	Indirect to Direct	RRI	
Shell Midden	Minor	Minor (Partial)	Indirect to Direct	RRI	
Stone Feature	Negligible	Minor (Partial)	Indirect to Direct	RRI	
Submerged Landscape Features					
Submerged land 300m either side of the centreline of any palaeochannels or 300m from the edge features that would have been present as semi-permanent or permanent water sources such as; creeks, rivers, swamp, wetlands or lakes during the last 65,000 years	Negligible (if avoided) Minor to Moderate (if harm cannot be avoided)	Minor (Partial)	Indirect to Direct	RRI-RRII	Assessing using Risk Rating is estimated as risk is emerging based on evolving and further investigation is required.
Flat to gently inclined surfaces on former escarpments, cliffs or ridges				RRI-RRII	A detailed submerged landscape assessment (as per the proposed Underwater Cultural Heritage process) is required to assess potential for landforms prior to physical impact associated with anchoring and drilling.
Rock overhangs				RRI-RRII	
Stony rises or eruption points				RRI-RRII	
Former barrier dunes				RRI-RRII	
Higher land that may have formed sea stacks or islands				RRI-RRII	
Cultural Features/Items identified through ethnohistorical research and consultation/public comment					
Ecological (fauna)	Unknown	Unknown	Indirect	N/A	If impacts are assessed as ecologically acceptable, it is likely that it will be culturally acceptable
Ecological (flora)				N/A	
Cultural Values (predicted based on desktop research)	Minor	Minor (Partial)	Indirect	RRII	Temporary, Removable, Visually unobtrusive

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APPENDIX M CONOCOPHILLIPS' HSE POLICY

HEALTH, SAFETY AND ENVIRONMENT POLICY

Our Commitment

ConocoPhillips is committed to protecting the health and safety of everybody who plays a part in our operations, lives in the communities in which we operate or uses our products. Wherever we operate, we will conduct our business with respect and care for both the local and global environment and systematically manage risks to drive sustainable business growth. We will not be satisfied until we succeed in eliminating all injuries, occupational illnesses, unsafe practices and incidents of environmental harm from our activities.

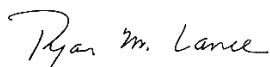
Our Plan

To meet our commitment, ConocoPhillips will:

- Demonstrate visible and active leadership that engages employees and services providers, and manage health, safety and environmental (HSE) performance as a line responsibility with clear authorities and accountabilities.
- Ensure that all employees and contractors understand that working safely is a condition of employment, and that they are each responsible for their own safety and the safety of those around them.
- Maintain “stop work” policies that establish the responsibility and authority for all employees and contractors to stop work they believe to be unsafe.
- Manage all projects, products and processes through their life cycles in a way that protects safety and health and minimizes impacts on the environment.
- Provide employees with the capabilities, knowledge and resources necessary to instill personal ownership and motivation to achieve HSE excellence.
- Maintain process, procedures and training to prepare for and respond to emergencies.
- Provide relevant safety and health information to contractors and require them to provide proper training for the safe, environmentally sound performance of their work.
- Measure, audit and publicly report HSE performance and maintain open dialogue with stakeholder groups and with communities where we operate.
- Comply with applicable regulations and laws.
- Work with both governments and stakeholders where we operate to develop regulations and standards that improve the safety and health of people and the environment.
- Maintain a secure work environment to protect ourselves, our contractors and the Company’s assets from risks of injury, property loss or damage resulting from hostile acts.
- Communicate our commitment to this policy to our subsidiaries, affiliates, contractors and governments worldwide and seek their support.

Our Expectations

Through implementation of this policy, ConocoPhillips seeks to earn the public’s trust and to be recognized as the leader in HSE performance.

A handwritten signature in black ink that reads "Ryan M. Lance".

Ryan Lance
Chairman and Chief Executive Officer
ConocoPhillips

APPENDIX N FAUNA MANAGEMENT PLAN



Australia Business Unit

Otway Exploration Drilling Program Fauna Management Plan

ABU2-000-EN-V01-D-00010

Revision Detail

Rev Number	Date
004	20 December 2024

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1. Introduction

1.1. Purpose

The purpose of this Fauna Management Plan (FMP) is to provide the details of the mitigation and management measures that will be used during the Otway Exploration Drilling Program (the exploration program) to reduce the impacts and risks of the activity to as low as reasonably practicable and an acceptable level required for Regulation 21(5)(c) of the Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations (Environment Regulations).

This FMP (Control Measure CM08) details how ConocoPhillips Australia (COPA) will carry out the exploration program in a manner by which the environmental impacts from anthropogenic underwater sound emissions and the risk of a collision to marine fauna will meet the Environment Regulations.

Prior to the exploration program (and its associated activities) commencing, a Fauna Management Implementation Plan will be developed to facilitate the implementation of this FMP on the exploration program vessels and MODU.

Key policy and/or regulation informing the development of control measures for the FMP are the:

- Environment Protection and Biodiversity Conservation (EPBC) Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales.
- EPBC Regulations 2000 Part 8: Vessel and Operating Procedures.

This FMP will ensure that the Environmental Performance Outcomes (EPOs) from the Otway Exploration Drilling Program Environment Plan (EP) relevant to fauna will be achieved such that:

- EPO3: No death or injury (physical or auditory) to listed threatened or migratory species from the activity.
- EPO4: Biologically important behaviours (such as foraging and breeding) can continue while the activity is being undertaken.
- EPO9: No disturbance to migrating southern right whale cows and calves while the activity is being undertaken
- EPO12: No disturbance to southern right whale cows and calves resting in the reproductive BIA.
- EPO13: No disturbance or displacement of foraging blue whales within the foraging BIA.
- EPO14: No instances of vessel strike with a marine mammal.

Environmental Performance Standards specific to the required performance of the FMP (CM08) are included in the EP.

1.2. Scope

1.2.1. Aspects

This FMP is a control measure to manage impacts from the following operational aspects as detailed in the Otway Exploration Drilling Program EP:

- Interaction with marine fauna – risk of a vessel collision with fauna.
- Underwater sound emissions – **impulsive** sound associated with:
 - geophysical surveys (such as sub-bottom profiling) and
 - formation evaluation (such as vertical seismic profiling conducted from the MODU).
- Underwater sound emissions – **non-impulsive** sound associated with:
 - Mobile offshore drilling unit (MODU) transiting,
 - MODU resupply (cargo transfer),
 - MODU drilling, and
 - Vessels in full DP undertaking anchoring (deploying/retrieving), MODU resupply (cargo operations), ROV operations or some other activity requiring vessel in full DP.

Otway Exploration Drilling Program Fauna Management Plan

1.2.2. Timing

This FMP applies at all times when the activities detailed in Section 1.2.3 are being undertaken in Commonwealth waters offshore of Victoria and Tasmania in the Otway Basin, and Section 4 applies to vessel movements in State waters during vessel transit.

1.2.3. Activities

This FMP applies to the activities to be undertaken within the Operational Area detailed in COPA's Otway Exploration Drilling Program Environment Plan and specifically:

- Seabed surveys: geophysical acquisition using a range of techniques including sub-bottom profiling.
- MODU anchoring and mooring incorporating vessels in full DP.
- Exploration drilling: MODU and vessels.
- Formation evaluation using a range of tools including Vertical Seismic Profiling (VSP).
- Vessel transit to/from drilling and operational areas (for Section 4).

Each activity listed above will have an Activity Action Zone (AAZ) prescribed to it to meet EPOs 3, 4 and 9 detailed in Section 1.1. These actions and their AAZs are detailed in Sections 4, 5, 6 and 7.

1.2.4. Safety of Operations

At all times and without exception, safety to personnel, well integrity and vessel management takes priority over the requirements described in this FMP.

1.3. Assumptions

Important assumptions that have been made in the development of this FMP are listed below to assist users in its interpretation and implementation. If an aspect of the FMP is unclear, users should consider these assumptions in determining what action, if any, to take. If an aspect of the FMP is still unclear, advice should be sought from the ConocoPhillips Australia (COPA) Environment Officer prior to users determining what action, if any, to take.

- 1) Vessel Masters, COPA Drilling Supervisor and COPA Environment Officer will work together to minimise impacts to marine fauna, and particularly whales, as long as the safety of operations is maintained.
- 2) Conservatism has been built into how the distances of the AAZ have been determined, taking account of sighting/detection accuracy, weather conditions, uncertainty in the activity impact assessment, and interpretation of whale behaviour.
- 3) Acoustic modelling was undertaken for a number of different locations for each activity and a number of different whale noise criteria (TTS, PTS, behavioural response). The AAZ distances are based on the furthest distance to the noise criteria from the acoustic modelling for each activity.

Every attempt has been made to limit ambiguity in the FMP content, however if there is a lack of clarity, or residual uncertainty about the instructions in this FMP, users are required to take actions in a manner that manages noise threats to whales, is precautionary, and will ensure impacts and risks meet the EPOs detailed in Section 1.1.

Whales are defined in the context of this FMP as either toothed whales (including so-called 'blackfish' (killer, pilot, false killer etc.), sperm whales, dwarf and pygmy sperm whales, and beaked whales); or baleen whales including blue, fin, sei, Bryde's, minke, humpback, southern right, and pygmy right whales.

Otway Exploration Drilling Program Fauna Management Plan

1.4. Glossary of Acronyms and Terms

Acronym or Term	Description
AAZ	Activity Action Zone The operational area where an activity is undertaken and a control action is required to be taken to meet the EPOs in Section 1.1.
Acoustic detection	Detection of whales via in-water passive acoustic monitoring (PAM) on gliders or fixed buoys.
ALARP	As Low as Reasonably Practicable
Anthropogenic	Chiefly of pollution or environmental change originating from human activity.
BW	All blue whale sub-species, pygmy blue whales, and Antarctic blue whale.
Cetaceans	Whales and dolphins.
Detection	Detection of whales which may occur via MFO observation or via passive acoustic monitoring (PAM).
EP	Environment Plan
EPO	Environmental Performance Outcome
Feeding	Whale in the act of eating/consuming food
FMP	Fauna Management Plan
Foraging	Whale searching for food
MFO	Marine Fauna Observer
MODU	Mobile Offshore Drilling Unit
PAM	Passive Acoustic Monitoring
Policy Statement 2.1	EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales
PTS	Permanent Threshold Shift
Resupply	Transfer of cargo, bulk materials and bunkering from a vessel to the MODU or MODU to vessel
SBP	Sub-bottom profiling
SRW	Southern right whale
TTS	Temporary Threshold Shift
VSP	Vertical seismic profiling
Whales	Toothed whales (including delphinid “whales” e.g. orca, pilot whale, false killer whale etc., as well as dwarf and pygmy sperm whales, and beaked whales) and baleen whales (listed in 1.3 above)

2. Implementation

This section details the accountabilities and responsibilities for the implementation of the FMP and the reporting requirements.

2.1. Roles and Responsibilities

Figure 2-1 shows the COPA organisation structure relevant to the FMP with responsibilities for each role detailed in Table 2-1.

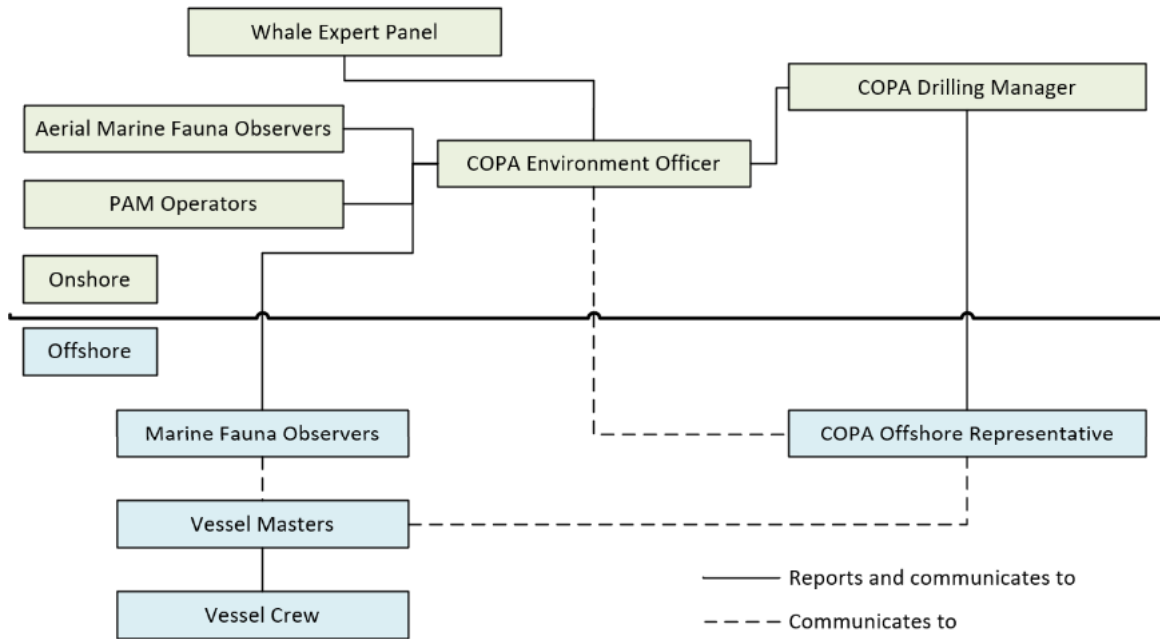


Figure 2-1: COPA Organisation Structure Relevant to the FMP

Table 2-1: COPA Roles and Responsibilities Relevant to the FMP

Role	Responsibilities
COPA Drilling Manager	Accountable for implementation of the FMP.
COPA Environment Officer	Coordinate the Whale Expert Panel.
	Convene daily operations meetings between observation platform leads to review data, inform ongoing operations, and trigger escalation of adaptive management measures (including the requirement to convene the Whale Expert Panel).
	Develop the FMP Implementation Plan with input from Whale Expert Panel, COPA Offshore Representative, MFOs and PAM Operators.
	Ensure the requirements for the implementation of the FMP are in place prior to the commencement of the operational activities the FMP is applicable to.
	Develop training material (PowerPoint or video presentation) to communicate the requirements of the FMP to those who have responsibilities to implement the FMP. Ensure the activity-specific induction provides an overview of the FMP including whale observation and recording requirements.
	Coordinate and document the review of effectiveness and compliance with the FMP. The review will be undertaken within one week of operational activity commencement and thereafter every four weeks while the operational activity is being undertaken. Review the MFO and PAM daily reports to ensure observations/detections and actions meet the requirements of the FMP.

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Role	Responsibilities
	<p>Coordinate MFO and PAM observations/detections and provide advice to the COPA Offshore Representative of required control actions.</p> <p>Develop daily FMP Report template of MFO and PAM observations/detections and control actions to be taken.</p> <p>Determine when aerial surveys are triggered and Whale Expert Panel input required.</p>
Whale Expert Panel (WEP)	<p>The WEP will develop a Terms of Reference for operations including decision-making criteria for flight objectives and flight plans, and triggers for escalation of meetings and activities (e.g. out-of-session meeting or additional flights), to support the development of the implementation plan for the Fauna Management Plan and development of the environmental induction program specific to fauna management plan requirements.</p> <p>The WEP will meet, as needed, within 24hrs of sighting more than one Blue Whale or Southern Right Whale, and at least weekly starting from two weeks prior to the commencement of drilling activities.</p> <p>Consist of a minimum of people:</p> <ul style="list-style-type: none"> • One relevant whale species expert, per key species (depending on time of year and likely presence). • Expert with experience with whale observations/detections in southern Australia. • COPA representatives with experience and understanding of seabed survey and drilling operations and EP requirements. <p>Provide advice and recommendations on the FMP Implementation Plan.</p> <p>Determine:</p> <ul style="list-style-type: none"> • When aerial surveys are most appropriate to ensure EPOs are met. • Flight path and observers. <p>Provide advice to COPA in relation to control actions to take when:</p> <ul style="list-style-type: none"> • BW or SRWs are detected in the Otway area. • Ongoing delays to start or restart of operational activity due to whales. • Activity cannot start or restart due to presence of whales i.e. > 12 hours.
COPA Offshore Representative (On MODU)	<p>Maintain open communication with COPA Environment Officer.</p> <p>Communicate the status of the operational activities (i.e. commencing, underway, or at Safe Point) to COPA Environment Officer.</p> <p>Decide whether control actions within the FMP can safely be implemented and take action accordingly.</p> <p>Document reasons for not following the FMP Plan, if required.</p> <p>Provide input into the review of effectiveness and compliance with the FMP.</p>
Vessel Masters	<p>Maintain open communication with COPA Offshore Representative and vessel-based MFOs.</p> <p>Communicate the status of the operational activities (i.e. commencing, underway, or at Safe Point) to COPA Offshore Representative and vessel-based MFOs.</p> <p>Decide whether control actions within the FMP can safely be implemented and take action accordingly.</p> <p>Document reasons for not following the FMP, if required.</p> <p>Provide input into the review of effectiveness and compliance with the FMP.</p> <p>Provide records of FMP training and activity-specific environmental induction to COPA Environment Officer.</p>
Marine Fauna Observers (MFOs)	<p>Provide input into the development of the FMP Implementation Plan.</p> <p>Undertake fauna observations/detections and immediately report whale and other fauna (MFO only) sightings/detections to the Vessel Master and COPA Environment Officer.</p>

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Role	Responsibilities
Passive Acoustic Monitoring (PAM) Operators	Provide advice to the COPA Drilling Manager and Vessel Master (or delegate) on the requirements of the FMP.
	Provide support to vessel crew in fauna identification and implementation of the FMP
	Provide input into the review of effectiveness and compliance with the FMP.
	Submit daily MFO/PAM Reports to COPA Drilling Manager, COPA Offshore Representative, Vessel Master, and COPA Environment Officer.
All vessel and MODU crew	Undertake activity induction that provides an overview of the FMP.
	Communicate whale sightings to MFOs immediately, supported by relevant information where available (e.g. latitude and longitude, time of sighting, no. of whales etc).

2.2. Records and Reporting

Records and reporting relevant to the implementation of the FMP are detailed in Table 2-2 below.

Table 2-2: Records and reporting for FMP

Records and Reporting Requirement	Responsible	Reported to	Description
Pre-activity FMP implementation review	COPA Environment Officer	COPA Drilling Manager	Documentation and records of evidence to show that the FMP implementation requirements are in place prior to the commencement of the activities.
Vessel and MODU crew induction records	Vessel Master COPA Drilling Supervisor	COPA Environment Officer	Induction records.
MFO and PAM Operator experience and qualifications	COPA Drilling Manager	COPA Environment Officer	Resume Training certificates Requirements described in EP Section 9.2.6 CM08: Fauna Management Plan
Aerial Marine Fauna Observer experience and qualifications	COPA Drilling Manager	COPA Environment Officer	Resume Training certificates Requirements described in EP Section 9.2.6 CM08: Fauna Management Plan
Communication of the FMP Implementation Plan to those who have responsibilities to implement the plan.	COPA Environment Officer	COPA Drilling Manager	Signed record that roles responsible for implementation and actions in this plan have been read and understood.
Daily observation/detection/action reports.	MFO PAM Operator	COPA Environment Officer	Report detailing marine fauna sightings and whale detections and any control actions taken.
Daily FMP Report	COPA Environment Officer	COPA Drilling Manager COPA Offshore Representative	Report detailing marine fauna sightings and whale detections and actions taken as per the FMP, and reasons actions not taken.
Review of effectiveness and compliance with the FMP	COPA Environment Officer	COPA Drilling Manager COPA Offshore Representative Vessel Master MFOs	Documentation and any actions from the review of effectiveness and compliance with the FMP.

Otway Exploration Drilling Program Fauna Management Plan

Records and Reporting Requirement	Responsible	Reported to	Description
End of Well / End of Program FMP Report	COPA Environment Officer	COPA Drilling Manager	Report detailing marine fauna sightings and whale detections, actions taken as per the FMP, and reasons actions not taken. COPA Environmental Officer to forward report on to relevant persons who requested access to this information (Implementation Strategy).
Sightings and detection data.	COPA Environment Officer	DCCEEW Australian Marine Mammal Centre	Spreadsheet including all applicable attributes requested by the DCCEEW Australian Marine Mammal Centre.

3. Detection of Whales

3.1. Detection Methods

In the context of the exploration program, COPA recognises that there are inherent challenges, complexities and uncertainties in detecting whales. With their vast range of species, behaviours, and habitats, a multifaceted approach is required for detection. No single method can guarantee the detection of all whales, but by combining several complementary techniques across various platforms, it maximises the likelihood of accurate and early detection and enhances the overall confidence in detecting whales, both above and below the water surface.

The array of whale detection methods to be used throughout the exploration program are:

- Vessel marine fauna observers
- Passive acoustic monitoring, and
- Aerial surveys.

These detection methods are detailed below.

3.1.1. Vessel Marine Fauna Observers (MFOs)

MFOs conduct visual observations using binoculars and the unaided eye, primarily from the bridge of the vessel or, ideally, from a more elevated vantage point to detect whales during daylight hours.

Daylight hours vary across a year (e.g. winter average of 9 hours daylight vs. summer average of 15 hours daylight), as too, the type of operations conducted vary during the exploration program. Accordingly, the resourcing of MFOs will vary throughout the program's operational period as outlined below

Drilling and VSP Operations

At all times, two MFOs will be stationed on the MODU support vessels whilst drilling and VSP activities are occurring.

Geophysical Survey

As the AAZ distances for geophysical survey are significantly smaller than for drilling and VSP activities, one MFO will be stationed on the survey vessel to undertake observations for marine fauna during daylight hours. When only one MFO is present on the survey vessel, the vessel Officer of the Watch (OOW) will support the MFO during breaks, when their duties permit. The OOW will be trained in sighting requirements.

MFO resourcing will be increased to two MFOs, where the geophysical survey spans more than five consecutive days at sea with over twelve hours of daylight to ensure the ongoing integrity of observations during extended daylight hours, and to manage fatigue of observers.

3.1.2. Passive Acoustic Monitoring

The whale detection strategy includes the integration of passive acoustic detection systems such as gliders or fixed buoys, that will have 24 hour operation and near real time reporting of whale species and location. The system to be engaged will be able to detect low-frequency whales such as BW and SRW.

Prior to deploying acoustic detection systems, they will be subjected to testing to validate their reliability and effectiveness. These tests will be specifically designed to confirm the systems' capability to detect whales, including those emitting low-frequency calls. However, it is acknowledged that the detection of marine mammals through acoustic means is contingent upon their vocalisation. Testing will also demonstrate the data streaming, information management and delivery systems that will operate 24/7 to support the exploration program.

Otway Exploration Drilling Program Fauna Management Plan

If whales are detected visually but not acoustically, the systems will be considered to be not validated. If this should occur, passive acoustic monitoring will be relied upon as a secondary form of detection with visual observations during daylight hours still the primary source of observation information. It should be noted that at no point is it intended that acoustics will replace the use of marine fauna observers. Its use is however considered to further increase the likelihood of whales being detected, both during daylight hours and night time operations and thus its use is important to reduce impacts and risks to ALARP.

The primary objective of the acoustic monitoring will be to inform the likelihood of whale presence in the activity area and risk of disturbance to biologically important behaviours. Even if it is not validated as a reliable primary source of detections, acoustic monitoring will be an important detection capability during hours of darkness when MFOs are unable to watch for whales, and is considered to further reduce the risk of impact by providing detection information that will feed into adaptive management processes and risk reviews undertaken by the WEP. Acoustic monitoring will be undertaken by experienced operators.

3.1.3. Aerial Surveys

Complementing vessel based MFO observations and passive acoustic monitoring, aerial surveys will be used primarily to inform activity planning based by providing a broader context regarding fauna and prey distribution and subsequently inform the likelihood of whale presence in the activity area. Aerial surveys may also be utilised on advice from the WEP to provide additional observations where the full AAZ cannot be monitored via other means and it is considered appropriate or necessary to achieve environmental outcomes. It is to be noted that aerial surveys are most effective in conditions of light winds and fair to good visibility, and given weather constraints in the region, it is not considered feasible to rely on observations from regular aerial surveys to inform daily management actions.

Aerial surveys will be overseen by the Whale Expert Panel who will develop the objectives, design and timing of aerial surveys prior to and during drilling activities. The primary objective of the aerial surveys will be to inform the likelihood of whale presence in the activity area and risk of disturbance to biologically important behaviours prior to each phase of activities.

Experienced operators, with a proven track record of conducting aerial surveys for whales, particularly threatened species such as BWs and SRW in the waters offshore Victoria, will be contracted to undertake these aerial surveys. In collaboration with the Whale Expert Panel, their expertise and knowledge of local whale populations is instrumental in supporting detection efforts.

Triggers for aerial surveys consist of:

- Directed by Whale Expert Panel.
- To obtain information to inform decision making.
- Ongoing delays to start or restart of activity due to whale.
- Activity cannot start or restart due to presence of whales i.e. > 12 hours.

3.1.4. Contingency Controls

There will be limited reliance on any single method of detection, rather reliance on coordination of collective observations and detection to support ongoing operations for example, the use of daytime observations and detection to support decision-making around hours of darkness and low visibility operations. There will be a feedback loop for information from daily meetings with adaptive management triggers for the Expert Panel risk reviews. The expert panel will have the capacity to adapt the observation and detection program and ongoing operations.

3.2. Whale Observation/Detection Area

The effectiveness of whale observation/detection efforts relies on the extent of the observation/detection area. The designated observation/detection area aims to be as extensive as practically feasible, encompassing, at a minimum, the AAZ delineated in each activity section. However, this area will be broadened whenever possible to ensure comprehensive coverage.

Determining the extent of the observation/detection area must consider the following factors:

- Visual acuity decreases over distances greater than 6 km and in sea states greater than Beaufort 4, and with it the ability to confidently identify whale species unless key behaviours are displayed (e.g. breaching humpback whale). Other environmental factors e.g. fog, rain, haze, glare, will also affect visual acuity of observers.
- The level of confidence in making a species identification visually/acoustically needs to be stated e.g. high-medium-low; particularly for MFOs in sea states greater than Beaufort 4.
- The inherent limitation(s) of the observation/detection platform i.e. height of observation platform above sea level, and structures on the platform that inhibit full visual coverage of the operational area.
- Noise generated by the MODU and vessels associated with the activity.
- Whale vocalisations, and their associated frequency and source level.
- Operational ability and acoustic performance of acoustic detection platform(s) i.e. glider or fixed mooring.

4. Marine Fauna Management Actions – Interactions between Vessels and Fauna

This section details the procedure and actions that will be implemented by vessel MFOs and Officers of the Watch (OOW) to ensure that interactions between vessels and marine fauna (whales, dolphins, seals, turtles, flocks of rafting or feeding birds) which may result in displacement of or injury, do not occur. Safe operation of the vessel must be considered/determined by the OOW prior to implementing any actions.

Figure 4-1 provides the actions to be implemented within the Drilling Area and other Operational Areas, and during other vessel movements.

4.1. Activity Action Zone

The AAZ is the operational area where an activity is undertaken and a control action is required to be taken to meet the EPOs in Section 1.1. For interactions between vessels and marine fauna, the AAZ is detailed in Table 4-1.

Table 4-1: Vessel AAZ

Activity/ Source	Action Zone Distance
Vessel movements	Whales including delphinid “whales”- 500 m Dolphins, Seals, Turtles, Flocks of Rafting or Feeding Birds – 150 m Southern right whale cow/calf pairs – 1 km
Justification for Action Zone Distance	
<p>All vessels, at all times, must comply with the EPBC Regulations 2000 Part 8: Vessel and Operating Procedures, which stipulates a 300 m caution zone for whales and a 150 m caution zone for dolphins.</p> <p>COPA as detailed in CM02: Vessel and Operating Procedures, has increased the whale caution zone to 500 m and specified a reduction of vessel speed to less than 5kts when marine fauna are sighted within the relevant AAZ, for activities under this FMP. The increase in the caution zone allows for the potential for poor observation conditions (i.e. sea state greater than Beaufort 4). For southern right whale cow and calf pairs, which are considered to be easily identifiable at distance, an increased precaution zone of 1 km will be implemented for vessel operations. This represents a doubling of the zone applied for solitary animals and is considered appropriately conservative noting the sensitivity of this life stage. The 1 km buffer well exceeds the 120 dB behavioural response range of 580 m predicted for a single vessel operating at the site closest to the southern right whale reproductive BIA.</p> <p>The EPBC Regulations 2000 Part 8: Vessel and Operating Procedures of 150 m will be applied to dolphins. This distance will also be applied to seals, turtles and flocks of rafting or feeding birds as it is feasible that they can be detected by MFOs at 150 m.</p>	

4.2. Relevant Marine Fauna Species

This procedure applies to all whales, dolphins, seals, and turtle species, and flocks of rafting or feeding seabirds.

Otway Exploration Drilling Program Fauna Management Plan

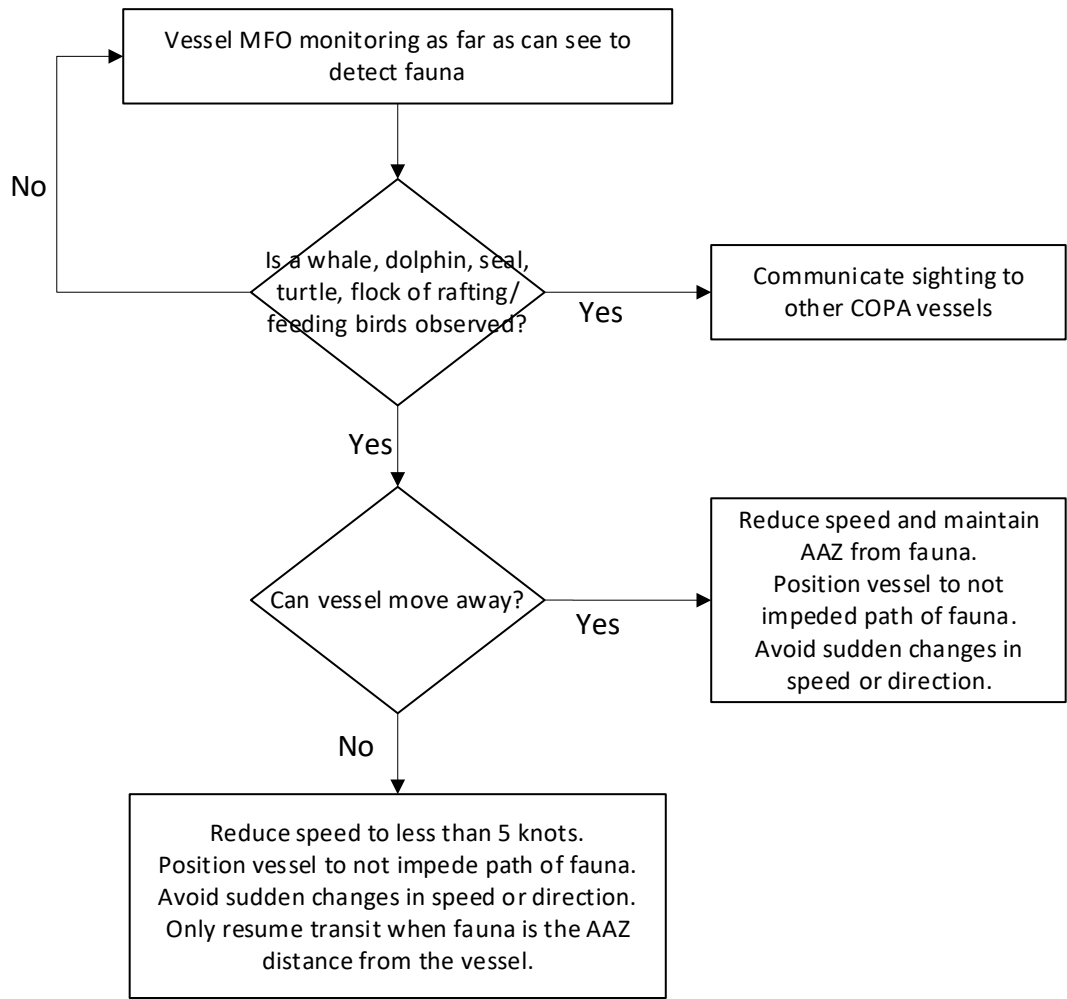


Figure 4-1: Fauna Management Actions – Vessel Fauna Interaction

5. Whale Management Actions – Geophysical Survey

This section details the procedure and actions that will be implemented by vessels when undertaking a geophysical survey. Figure 5-1 provides the actions to be implemented.

Explanatory notes are detailed in the following sections.

5.1. Activity Action Zone

The AAZ is the operational area where an activity is undertaken and a control action is required to be taken to meet the EPOs in Section 1.1. For geophysical surveys the AAZ is detailed in Table 5-1

Table 5-1: Geophysical AAZ

Activity/ Source	Action Zone Distance	PTS 24 hr	TTS 24 hr	Behavioural Response
Geophysical survey – sub bottom profiler (SPB)	500 m	Not reached	20 m	130 m
Justification for Action Zone Distance				
Based on the acoustic modelling for the sub-bottom profiler the furthest distance to each noise effect criteria for whales are used. The furthest distance is 130 m. However, CM02: Vessel and Operating Procedures detail that vessel will implement a caution zone of 500 m between whale and vessels. As the geophysical vessel is manoeuvrable, even when the geophysical equipment is in the water, the 500 m caution zone will be applied to geophysical surveys.				

5.2. Relevant Whale Species

This procedure applies to **ALL whale species**.

5.3. Pre-Activity Whale Observation

Based on a 30-minute MFO visual observation survey of the AAZ preceding the activity commencement, the geophysical survey can commence if no whales are seen within or are likely to enter the AAZ.

Given the lower sound levels and shorter observation distances associated with this activity, a timing of 30 minutes for pre-activity whale observation surveys and restarts is considered sufficient time for the vessel and/or whale to have moved 500 m away and to identify if no whales are within the AAZ, based on Policy Statement 2.1 and considers deep diving species such as BW which have a typical dive time of less than 30 minutes. However, it is understood that a foraging BW may not move at all if prey is in the vicinity.

5.4. During Acquisition

As the geophysical survey vessel is manoeuvrable, even when the geophysical equipment is in the water, the vessel will implement a caution zone of 500 m from all whales. If the vessel cannot move 500 m from a whale, the SBP is to be shut down and only restarted when it is 500 m away from the whale.

5.5. Hours of Darkness Start Arrangements

SBP equipment may be started at the onset of darkness if no whales have been observed during MFO visual observation survey in the 30 minutes leading up to darkness.

SBP equipment will not be started during the hours of darkness if there have been three or more delays to the start-up of the equipment due to whales in the preceding daylight hours.

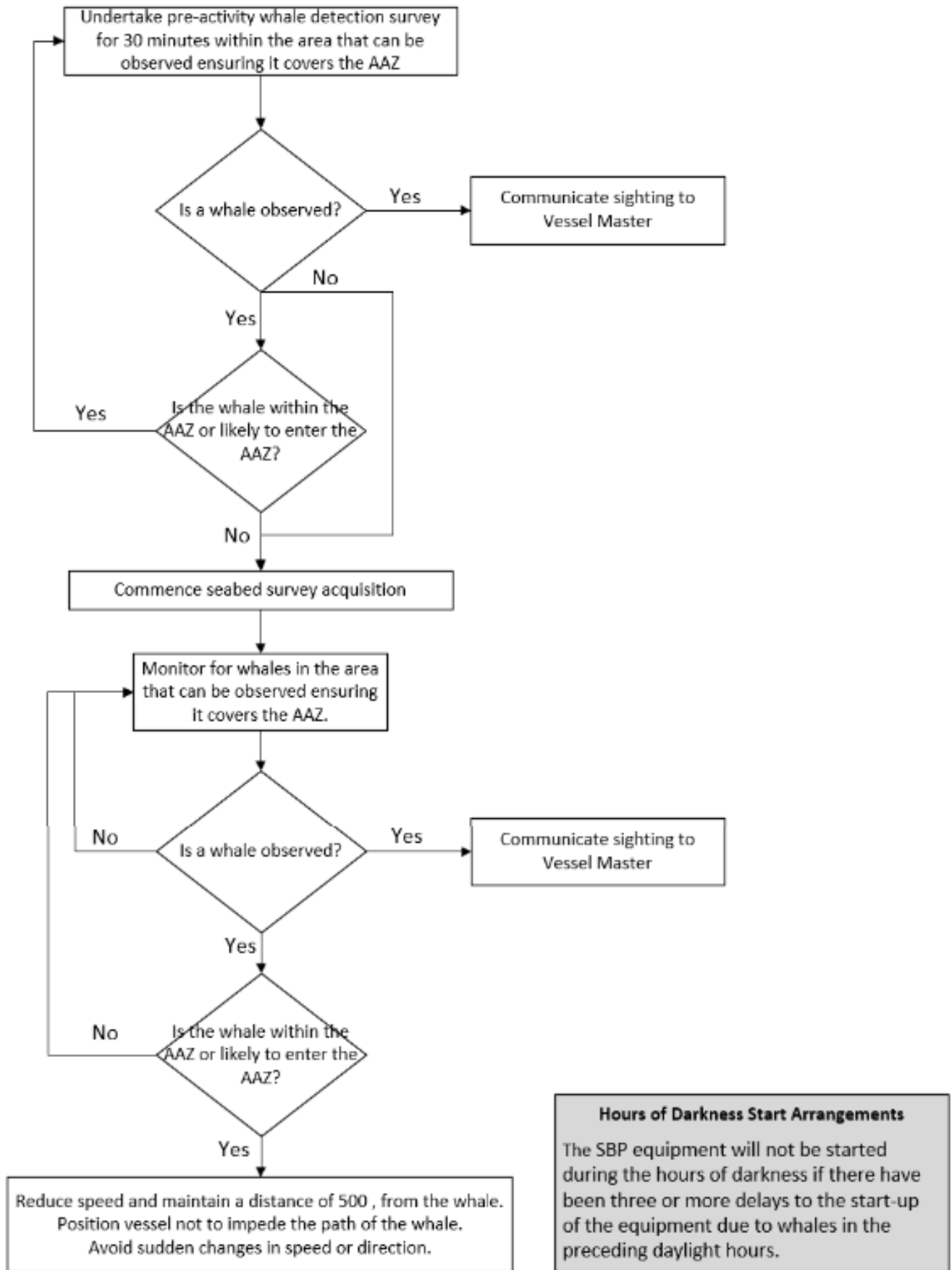


Figure 5-1: Whale Management Actions – Geophysical Survey

6. Whale Management Actions – Vessels on DP

This section details the procedure and actions that will be implemented by vessels when undertaking activities using dynamic positioning (DP) to maintain station, for example collecting geotechnical samples. This does not extend to vessels undertaking resupply of the MODU (cargo transfer) during drilling, which is addressed in Section 8, below.

Figure 6-1 provides the actions to be implemented. Explanatory notes are detailed in the following sections.

6.1. Activity Action Zone

The AAZ is the operational area where an activity is undertaken and a control action is required to be taken to meet the EPOs in Section 1.1. For vessels on DP the AAZ is detailed in Table 6-1.

Table 6-1: Vessel on DP AAZ

Activity/ Source	Action Zone Distance	PTS 24 hr	TTS 24 hr	Behavioural Response
Vessel on DP	1.5 km	150 m	690 m	1.39 km
Justification for Action Zone Distance				
Based on the acoustic modelling for anchor pre-lay using vessels on DP, the furthest distance to a noise effect criterion for whales, of 1.39 km, has been used, and has been rounded up to take into account accuracy of estimation of distance at sea.				

6.2. Relevant Whale Species

This procedure applies to **ALL whale species**.

6.3. Pre-Activity Whale Observation

Based on a 30-minute MFO visual observation survey of the AAZ preceding the activity commencement, the DP can commence if no whales are seen within or are likely to enter the AAZ.

Given the lower sound levels and shorter observation distances associated with this activity, a timing of 30 minutes for pre-activity whale observation surveys and restarts is considered sufficient time for the vessel and/or whale to have moved 1.5 km away and to identify if no whales are within the AAZ, based on Policy Statement 2.1 and considers deep diving species such as BW which have a typical dive time of less than 30 minutes.

6.4. During DP

Once sampling has commenced observations will be undertaken as far as can be seen covering the AAZ. If a whale is sighted within the AAZ, the following will occur:

- If the vessel can do so it will move away from the whale and maintain a minimum separation distance equal to the AAZ.
- If the vessel cannot move away from the whale, the vessel will reduce thrusters if safe to do so. The activity will cease as soon as it is safe, and the vessel will move out of the AAZ.

The activity can recommence once:

- No whales are observed for 30 min within the AAZ; or
- Whales are observed leaving the AAZ.

6.5. Hours of Darkness Start Arrangements

Vessels may operate on DP at the onset of darkness if no whales have been observed during MFO visual observation survey in the 30 minutes leading up to darkness.

DP activities will not be started during the hours of darkness if there have been three or more delays to DP activities due to whales in the AAZ in the preceding daylight hours.

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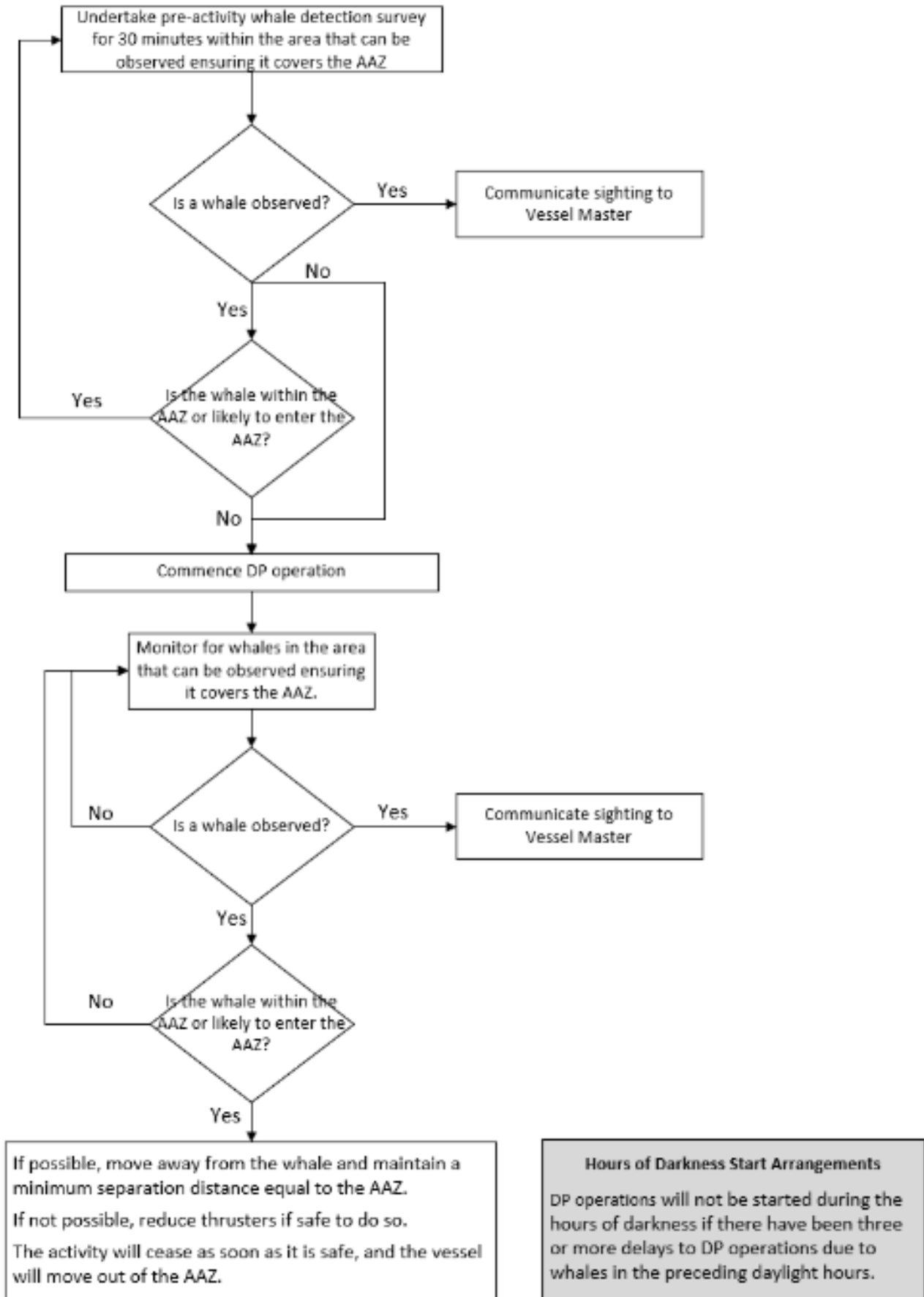


Figure 6-1: Whale Management Actions – Vessels on DP

7. Whale Management Actions – VSP

This section details the procedure and actions that will be implemented for short duration VSP activities, which are limited to a maximum of 12 hours per well. Figure 7-1 provides the actions to be implemented.

Explanatory notes are detailed in the following sections.

7.1. Activity Action Zone

The AAZ is the operational area where an activity is undertaken and a control action is required to be taken to meet the EPOs in Section 1.1. For VSP the AAZ is detailed in Table 7-1.

Table 7-1: VSP AAZ

Activity/ Source	Action Zone Distance	PTS 24 hr	TTS 24 hr	Behavioural Response
Vertical Seismic Profiling (VSP)	April to end of October: 6.5 km SRW cow-calf pair 1.5 km all other whales*	330 m	1.5 km	6.48 km SRW cow-calf pair 1.5 km all other whales
Justification for Action Zone Distance				
Based on the acoustic modelling for the VSP the furthest distance to each noise effect criteria for whales are used. COPA has applied a precautionary approach for SRW cow calf pairs applying a lower noise effect criteria hence the greater distance.				
* Note: Given that the activity action zone for all other whales is based on the effect distance to TTS for VSP, remodelling will be completed prior to commencement of these activities in line with the NMFS Technical Guidance (2024), and the related Activity Action Zones updated where new predicted ranges to effects exceed existing action zones.				

7.2. Relevant Whale Species

This procedure applies to **ALL** whale species; however some specific considerations have been given to endangered species such as blue and southern right whales.

During April to the end of October it is likely that pregnant SRWs are moving through the migration BIA to the coastal reproduction BIA, and SRW cow-calf pairs are moving from the reproduction BIA. Thus, during this period detections for whales will be undertaken in the larger 6.5 km AAZ but actions will only be implemented for SRWs, or whales that cannot be confirmed not to be SRWs, within the 6.5 km AAZ. It is possible that SRWs may occur within the Otway area earlier than April or later than October, and how this will be managed is detailed in Section 6.7 Adaptive Management.

For all other whale species, actions will be applied within the 1.5 km AAZ.

7.3. Observation and Detection

As detailed in Section 3, COPA will implement several whale observation and detection methods consisting of MFOs and PAMs during VSP. This approach ensures that detections can be undertaken within the VSP AAZs.

Timing of 60 minutes for pre-activity whale observation/detection surveys, soft starts and restarts, to identify if no whales are within the AAZ is based on Policy Statement 2.1 and considers deep diving species such as BW which have a typical dive time of less than 30 minutes, with a precautionary approach applied, increasing this observation/detection period to 60 minutes as explained in Appendix B.

7.4. Pre-Activity Whale Observations/Detections

Within 48 hours prior to the commencement of VSP within VIC/P79-North, the closest possible operational area to the reproduction BIA, a vessel survey will be conducted to confirm no SRW cows with calves are resting on migration within 10 km of the sound source. Based on a clear vessel survey (for VIC/P79-North only) and a preceding 60-minutes of MFO visual observation within the relevant AAZ and concurrent PAM detection survey of the AAZ, if no whale observed or detected in the VSP AAZ activity can commence.

7.5. Soft Start

For VSP, an initial soft start will be implemented after the Pre-Activity Whale Observation/Detection has confirmed that no whales are present within the VSP AAZ. The VSP soft start will be undertaken by gradually bringing on each acoustic source over a 30 min period.

If a whale enters the VSP AAZ during soft start, the acoustic source will be shut down. The vessel MFO and/or PAM Operator will constantly monitor the whale. The soft start will be delayed and only resume after the whale has been observed/detected to move outside the VSP AAZ, or when 30 min has lapsed since the whale was last sighted.

7.6. Shutdown

Once the VSP is at full power, if any species of whale is observed or detected within or is likely to enter the VSP AAZ, the VSP source will be shut down.

Power-up of the VSP source will only occur after the whale has been observed or detected to move outside the VSP AAZ Low power zone, or when 30 minutes have lapsed since the whale was last sighted/detected

7.7. Hours of Darkness / Low Visibility Arrangements

VSP activities can commence during the hours of darkness/low visibility if no whales are acoustically detected within the VSP AAZ in the preceding 60 minutes.

VSP can continue during hours of darkness or low visibility conditions:

- providing there have not been 3 or more whales observed/detected within the VSP AAZ during the preceding 24-hour period.

Three whales within the preceding daylight hours (i.e., sunrise to sunset) are seen as an indicator that whales may be migrating or foraging/feeding in the area and therefore could be present in the AAZ at night.

If a whale is detected entering or within the VSP AAZ during the hours of darkness or low visibility, the VSP will be shut down. PAM Operators, operating remotely from onshore, will constantly monitor for whale calls. Power-up of the VSP source will only occur after the whale has been detected to move outside the VSP AAZ, or when 60 min has lapsed since the whale was last detected.

7.8. Adaptive Management

It is possible that SRWs may occur within the Otway area earlier than April or later than October. As drilling will be undertaken prior to VSP occurring, if SRWs have been observed 1 week prior to VSP operations outside of the April to end of October period, the actions within this section will be implemented within the 6.5 km AAZ.

Otway Exploration Drilling Program Fauna Management Plan

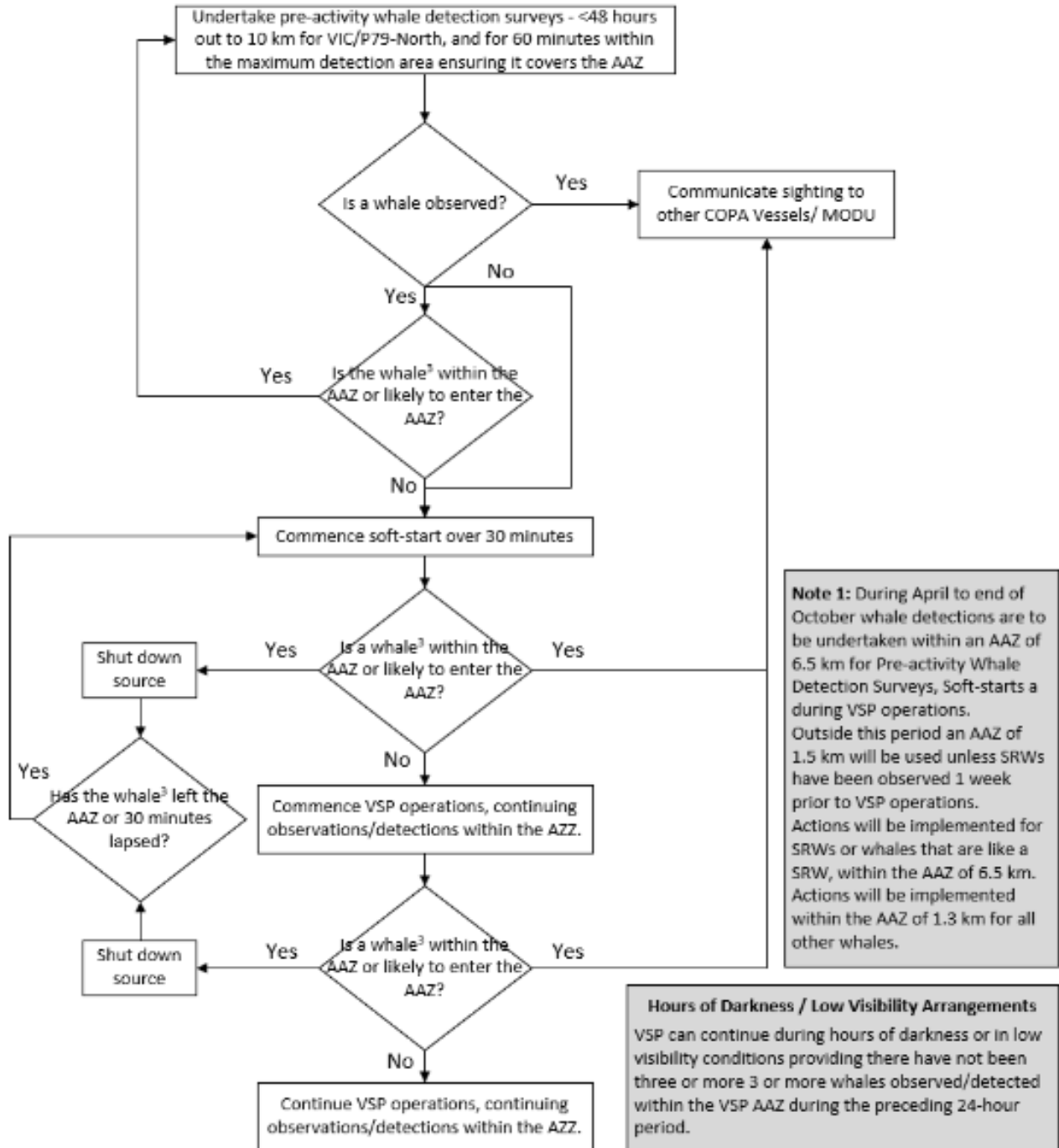


Figure 7-1: Whale Management Actions – VSP

8. Whale Management Actions – Drilling

This section details the procedure and actions that will be implemented when drilling. Figure 8-1 provides the actions to be implemented.

Explanatory notes are detailed in the following sections with actions to be undertaken for each activity detailed in Tables 8-2 to 8-5.

8.1. Activity Action Zone

The AAZ is the operational area where an activity is undertaken and a control action is required to be taken to meet the EPOs in Section 1.1. These zones are different for different drilling activities and different drilling locations and are based on the furthest distance to the cetacean behaviour, TTS or PTS noise criteria from acoustic modelling, as presented in Table 8-1.

The acoustic modelling showed a dramatic difference in distances to the cetacean noise criteria for the shelf-edge location as noise propagates further into deepwater in the offshore direction. Figure 8-1 shows the location of the shelf-edge for the implementation of the Drilling AAZ in Table 8-1.

Due to the nature of the drilling activities, the activities cannot be immediately stopped as this would create operational safety risks. This procedure identifies ‘safe points’ where an activity can be stopped, and action taken to reduce noise levels. Table 8-1 details the safe points for each activity. Figure 8-2 and Tables 8-2 to 8-5 detail the actions to be taken for each activity.

Table 8-1: Drilling AAZ

Activity/ Source	Action Zone Distance	PTS 24 hr	TTS 24 hr	Behavioural Response	Safe Point
Anchor pre-lay	2.8 km*	Not reached	2.73 km	0.5	Anchor deployed
MODU mooring	13 km	320 m	3.6 km	12.2 km	MODU securely anchored.
Drilling with vessel on standby	2.5 km	30 m	460 m	2.44 km	Next positive test of well integrity (e.g., after cementing each casing)
MODU resupply (cargo transfer): <ul style="list-style-type: none"> On shelf all directions On shelf edge onshore direction *See Figure 8-1 for shelf edge zones and directions	13 km	200 m	1.93 km	12.6 km	Resupply complete
MODU resupply (cargo transfer): <ul style="list-style-type: none"> On shelf edge offshore direction 	23 km	200 m	1.93 km	22.8 km	Resupply complete
Justification for Action Zone Distance					
Based on the acoustic modelling for the drilling activities the furthest distance to each noise effect criteria for whales are used.					
* Note: Given that the activity action zone for anchor pre-lay is based on the effect distance to TTS, remodelling will be completed prior to commencement of these activities in line with the NMFS Technical Guidance (2024), and the related Activity Action Zones updated where new predicted ranges to effects exceed existing action zones.					

8.2. Observation and Detection

As detailed in Section 3, COPA will implement several whale observation and detection methods consisting of MFOs, PAMs and aerial surveys during drilling. This approach ensures that detections can be undertaken within the relevant Activity AAZs and provide additional information on the movement of SRW into and out of reproduction BIA and BW into and out of the Otway Region. PAM technologies will be the primary detection method for distances greater than 6 km from the MODU.

Aerial surveys will be utilised periodically during drilling operations to provide information that may be relevant to MODU resupply and other activities. The WEP will inform the objectives, design and timing of aerial surveys prior to and during these activities. There is no maximum number of overflights, the minimum frequency of aerial surveys are provided in the performance standards.

The typical timing of 30 minutes for pre-activity whale observation/detection surveys to identify if no whales are within the AAZ is based on Policy Statement 2.1 and considers deep diving species such as BW which have a typical dive time is less than 30 minutes. However, a precautionary approach has been applied, increasing this observation/detection period to 60 minutes as explained in Appendix B.

A minimum of two aerial surveys will be undertaken in the two weeks prior to the commencement of the drilling campaign. These aerial surveys will be used to inform activity planning.

8.3. Relevant Whale Species

As the drilling activities will be undertaken within BW and SRW biologically important areas (BIAs) and there is the possibility that other low frequency cetaceans including fin, pygmy right, Bryde's, minke and sei whales, may also be undertaking biologically important behaviours in the area, as identified by the EPBC Act Protected Matters Search Tool (PMST), this procedure applies to these species during drilling operations.

The procedure was identified as a control measure to ensure that the activity could be carried out in a manner by which the impacts to BWs and SRWs and other whales undertaking biologically important behaviours will be minimised to an acceptable level.

As the drilling activities will be undertaken within the PBW and SRW BIAs this FMP procedure for drilling was identified as a control measure to ensure that the activity could be carried out in a manner by which the impacts to PBWs and SRWs will be of an acceptable level.

As baleen whales such as BWs, SRWs, fin, pygmy right and sei whales can be hard to distinguish from other baleen whales the following will apply.

A BW, SRW, fin, pygmy right or sei whale is a whale that:

- Is confirmed to be a BW, SRW, fin, pygmy right or sei whale; or
- If some uncertainty exists, is 'like a blue whale, fin or sei whale' or 'like a SRW'.

NOTE: Other low frequency cetaceans that may be present in the operational area, including humpback, minke and Bryde's whales. These species were not identified as undertaking biologically important behaviours in the EPBC Act PMST search for the environment that may be affected by underwater sound (see Otway Exploration Drilling Program Environment Plan, Table 4-13: Marine mammal species that may occur within relevant EMBA, and protection status).

For high-frequency cetaceans, the PMST search did not identify any species listed as threatened, and no biologically important areas or behaviours were identified. Consequently, this FMP only applies to those species specified in this document.

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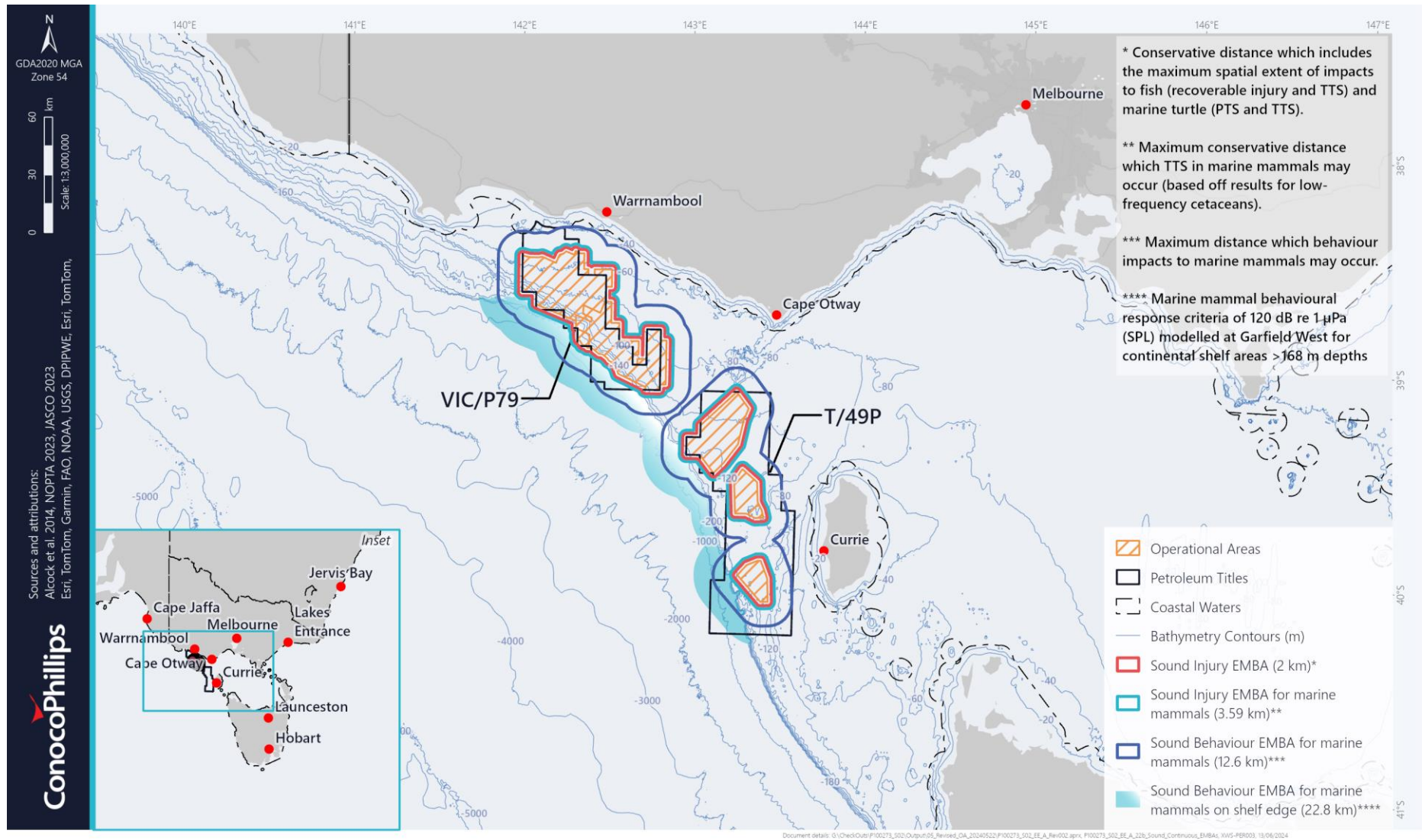


Figure 8-1: Continuous Sound EMBA

8.4. Pre-Activity Whale Observation/Detection

Based on a preceding 60-minutes of MFO visual observation and PAM survey of the AAZ, if no whale is observed or detected in the Drilling AAZ, activity can commence.

8.5. Hours of Darkness Start Arrangements

Drilling activities can commence during the hours of darkness if no whales are acoustically detected within the AAZ.

If whales are detected via PAMs within the AAZ during the hours of darkness, operations will proceed to the next safe point as detailed in Tables 8-2 to 8-5.

8.6. Adaptive Management

A risk review will be undertaken if there are 3 consecutive days of BWs or SRWs sighted within the Drilling AAZ.

The risk review will be documented and will consider at a minimum:

- Increased duration of Pre-Activity Whale Observation/Detection Surveys.
- Increased hours of darkness activity trigger.
- If the MODU can move to a well location where less or no whales have been observed/detected. This may need to be informed by vessel or aerial surveys.
- If vessel or aerial surveys are required to detect whales.

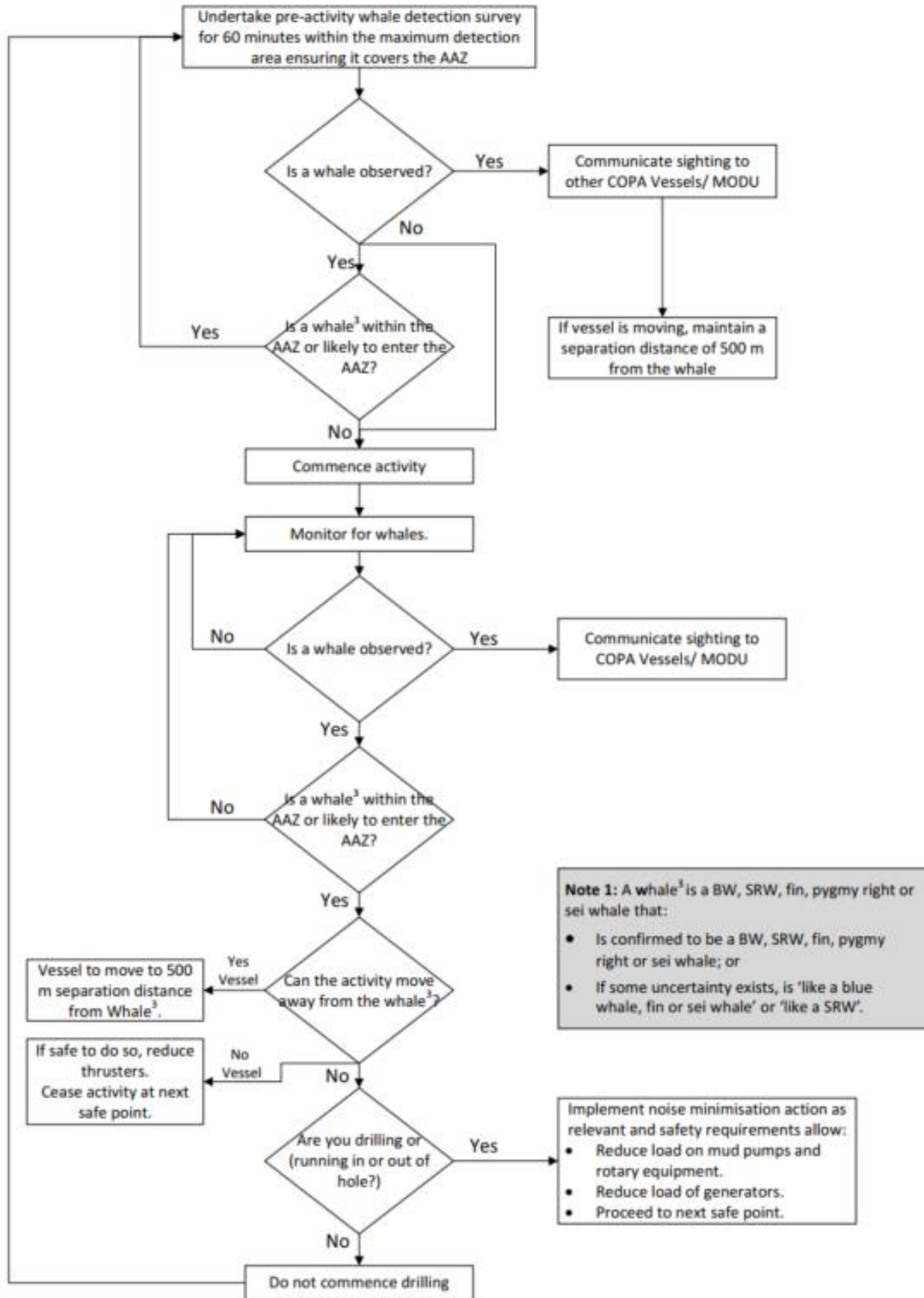


Figure 8-2: Whale Management Actions – Drilling

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Table 8-2: Whale Management Actions – Anchor Pre-lay

Activity/ Source	Pre-Activity Actions and Start Criteria	Safe Point
Anchor pre-lay	<p>Prior to commencing anchor pre-lay at a well location a Pre-Activity Whale Observation/Detection Survey¹ will be undertaken based on a preceding 60-minutes of MFO visual observation of the AAZ, if no whale is observed or detected in the AAZ, activity can commence. .</p> <p>Commence anchor pre-lay and move to next Safe Point when absence of whales³ in AAZ is confirmed².</p>	Anchor deployed.
Actions During Activity		
<p>Observation/detection¹ of the AAZ will continue while the activity is being undertaken.</p> <p>If a whale³ is observed/detected within the AAZ while the vessel is deploying an anchor the vessel will do the following if safe to do so:</p> <ul style="list-style-type: none"> • Reduce thrusters; and/or • Move away from the whale. <p>Once the anchor is deployed the next anchor can be deployed if:</p> <ul style="list-style-type: none"> • The whale³ is observed leaving the AAZ; or • No whales³ observed for 60 min within the AAZ. 		
Notes		
<p>¹: Detection may be via aircraft or MFO on vessels, or a combination of these as detailed in Section 3.1.</p> <p>²: Absence of whales³ means:</p> <ul style="list-style-type: none"> • No whales³ observed for 60 min within the AAZ. • Whales³ observed leaving the AAZ. <p>³: A BW, SRW, fin, pygmy right or sei whale is a whale that:</p> <ul style="list-style-type: none"> • Is confirmed to be a BW, SRW, fin, pygmy right or sei whale; or • If some uncertainty exists, is ‘like a blue whale, fin or sei whale’ or ‘like a SRW’. 		

Otway Exploration Drilling Program Fauna Management Plan

Table 8-3: Whale Management Actions – MODU Mooring

Activity/ Source	Pre-Activity Actions and Start criteria	Safe Point
MODU mooring	<p>Prior to commencing mobilisation of the MODU to a new well location a Pre-Activity Whale Observation/Detection Survey¹ of the new well location will be undertaken as per Section 8.4.</p> <p>Commence MODU mooring to Safe Point when absence of whales³ in the new well location AAZ is confirmed².</p>	MODU securely anchored.
Actions During Activity		
<p>Observation/detection¹ of the new well location AAZ will continue while the MODU is transiting to the new well location.</p> <p>If whales³ are observed or detected within the AAZ whilst the MODU is in transit to a new well location, this will be communicated to the COPA Drilling Supervisor on the MODU. The MODU direction of travel will be adjusted, and transit speed slowed where safe to do so, to allow time for the whales to move out of the new well location AAZ.</p> <p>Once mobilisation has commenced if whales³ are observed or detected within the new well location AAZ the MODU can only enter the AAZ and commence mooring if:</p> <ul style="list-style-type: none"> • No whales³ observed for 60 min within the AAZ; or • Whales³ observed leaving the AAZ; or • The safety of the MODU and other marine users necessitates such action. In this situation the decision will be made by the COPA Drilling Manager on the MODU, and reasons documented. 		
Notes		
<p>¹: Observation/detection may be via aircraft, MFO on vessels or PAMs, or a combination of these as detailed in Section 3.1.</p> <p>²: Absence of whales means:</p> <ul style="list-style-type: none"> • No whales³ observed/detected for 60 min within the AAZ. • Whales³ observed/detected leaving the AAZ. <p>³: A BW, SRW, fin, pygmy right or sei whale is a whale that:</p> <ul style="list-style-type: none"> • Is confirmed to be a BW, SRW, fin, pygmy right or sei whale; or • If some uncertainty exists, is 'like a blue whale, fin or sei whale' or 'like a SRW'. 		

Otway Exploration Drilling Program Fauna Management Plan

Table 8-4: Whale Management Actions – MODU Drilling

Activity/ Source	Pre-Activity Actions and Start Criteria	Safe Point
Drilling with vessel on standby	<p>Prior to commencing drilling and at each safe point a Pre-Activity Whale Observation/Detection Survey¹ will be undertaken as per Section 8.4.</p> <p>Drilling can commence or proceed to next Safe Point when absence of whales³ in AAZ is confirmed².</p>	Next positive test of well integrity (e.g. after cementing each casing)
Actions During Activity		
<p>Observation/detection¹ of the AAZ will continue while the activity is being undertaken.</p> <p>If whales³ are observed within the AAZ while drilling to the next safe point the MODU will do the following if safe to do so:</p> <ul style="list-style-type: none"> • Reduce load on mud pumps and rotary drilling equipment. • Reduce load on generators. <p>Once the well is at the next safe point drilling can continue as per the Pre-Activity Actions and Start Criteria.</p>		
Notes		
<p>¹: Observation/detection may be via aircraft, MFO on vessels or PAMs, or a combination of these as detailed in Section 3.1.</p> <p>²: Absence of whales means:</p> <ul style="list-style-type: none"> • No whales³ observed/detected for 60 min within the AAZ. • Whales³ observed/detected leaving the AAZ. <p>³: A BW, SRW, fin, pygmy right or sei whale is a whale that:</p> <ul style="list-style-type: none"> • Is confirmed to be a BW, SRW, fin, pygmy right or sei whale; or • If some uncertainty exists, is 'like a blue whale, fin or sei whale' or 'like a SRW'. 		

Otway Exploration Drilling Program Fauna Management Plan

Table 8-5: Whale Management Actions – MODU Resupply

Activity/ Source	Pre-Activity Actions and Start Criteria	Safe Point
MODU resupply	<p>Prior to commencing MODU resupply a Pre-Activity Whale Observation/Detection Survey¹ will be undertaken as per Section 8.4.</p> <p>MODU resupply can commence and proceed to the Safe Point when absence of whales³ in AAZ is confirmed².</p>	Resupply complete.
Actions During Activity		
<p>Whale observation/detection monitoring of the AAZ will continue while the activity is being undertaken.</p> <p>If whales³ are observed/detected within the AAZ during MODU resupply the vessel will do the following if safe to do so:</p> <ul style="list-style-type: none"> • Reduce thrusters. • Cease resupply and move away from the whale maintaining a distance of 500 m from the whales as detailed in Section 4 (Vessel Whale Interaction). 		
Notes		
<p>¹: Observation/detection may be via aircraft, MFO on vessels or PAMs, or a combination of these as detailed in Section 3.1.</p> <p>²: Absence of whales means:</p> <ul style="list-style-type: none"> • No whales³ observed/detected for 60 min within the AAZ. • Whales³ observed/detected leaving the AAZ. <p>³: A BW, SRW, fin, pygmy right or sei whale is a whale that:</p> <ul style="list-style-type: none"> • Is confirmed to be a BW, SRW, fin, pygmy right or sei whale; or • If some uncertainty exists, is 'like a blue whale, fin or sei whale' or 'like a SRW'. 		

9. Managing Uncertainty

ConocoPhillips Australia have undertaken an impact assessment of the potential impacts of underwater sound emissions on whales in accordance with internal company procedures, international standards, and regulatory requirements. This utilised internationally accredited modelling to further improve knowledge in this area.

ConocoPhillips Australia has been in contact with international experts in underwater acoustics (Craig McPherson (2024)) who has confirmed that modelling has been conducted using conservative noise criteria for behavioural response from blue whales and southern right whales.

ConocoPhillips Australia acknowledges no single method of detection can guarantee the detection of all whales. ConocoPhillips Australia aims to utilise multiple lines of evidence for whale detection, combining MFO's, aerial surveys and PAM operators with the aim of maximising the likelihood of accurate and early detection. To support the multiple line of evidence for whale detection, other forms of whale detection (specifically for low frequency cetaceans) using passive acoustic monitoring (PAMs) are in the process of being proven for offshore drilling activities. Trials have been undertaken using tethered, uncrewed surface vehicle or glider tethered hydrophones that can transmit acoustic data back to shore based PAM Operators.

To manage this uncertainty ConocoPhillips Australia proposes to undertake the following:

- **Whale Expert Panel** – ConocoPhillips Australia will utilise an Expert Panel that can provide advice and recommendations in relation to i) robustness of any new whale detection systems, ii) implementation of any new whale detection system, iii) changes to actions if there are ongoing delays to the start or restart of activities due to whales and iv) the survey design and timing of aerial surveys to inform likelihood of whale presence and risk. The Whale Expert Panel will consist of whale experts and an MFO with experience of whales in southern Australia.
- **Acoustic Trials** – Based on advice from the Whale Expert Panel, ConocoPhillips Australia will liaise with other Titleholders to support trials and potential testing of new and novel whale detection systems (as discussed above).

Appendix A: Blue Whale Diving Summary

Diving behaviour of blue whales associated with feeding at depth was observed by Gill and Morrice (2003) in the Otway region, who note that blue whales dived steeply, submerging for 1 – 4 minutes, then returned to the surface. Tagging of a pygmy blue whale at the Perth Canyon identified 1677 dives over the tag duration (7.6 days) (Owen et al. 2016). The duration of dives was:

- Feeding - mean of 7.6 minutes, maximum of 17.5 minutes.
- Migratory – mean of 5.2 minutes, maximum of 26.7 minutes.
- Exploratory – mean of 8.6 minutes, maximum of 22.05 minutes.

Tagging of 13 pygmy blue whales (five of which had tags that monitored dive depth and duration) in the Bonney upwelling identified (Möller et al. 2020):

- Whales predominantly carried out area-restricted search (presumably foraging) with generally shallow and short dives. However, dives were generally deeper at night compared to during the day.
- Whales performed mostly square shaped dives that were shallow in depth and short in duration.
- Dives recorded to a maximum of 492 m (mean = 59.5 m \pm 94.3), and for a maximum duration of 112 minutes (mean = 6.1 minutes \pm 5.2).

Although the maximum recorded dive time was 112 minutes, the mean dive time of 6.1 minutes \pm 5.2 provides confidence that the typical dive time is less than 30 minutes (Möller et al. 2020). Tagging of eight blue whales off California (Irvine et al. 2019) identified that dive durations were as long as 30.7 minutes, and no feeding lunges were recorded during dives > 20 minutes in duration. A dive duration of about 10 min would normally be near the limit expected in the Otway region. However, given the unpredictability of dive times a precautionary approach will be adopted whereby observations will be undertaken for 60 minutes prior to commencement of operations.

References

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APPENDIX O DESKTOP MARITIME HERITAGE ASSESSMENT



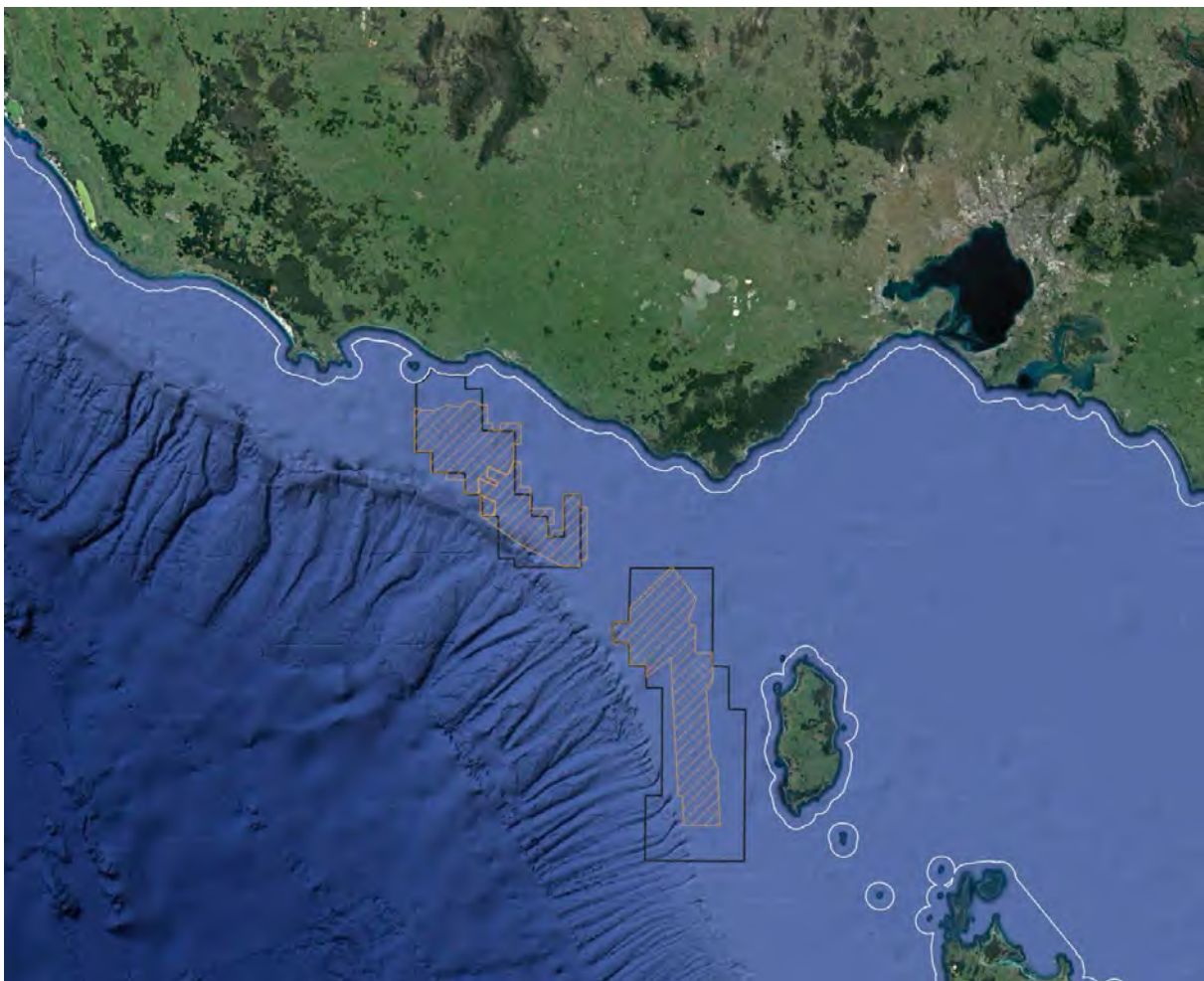
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Otway Exploration Drilling Program



Desktop Maritime Heritage Assessment

Otway Basin
Commonwealth waters

January 2024

Otway Exploration Drilling Program Desktop Maritime Heritage Assessment

Prepared for:

ConocoPhillips

By:



January 2024

Cosmos Archaeology Job Number J23/16

Cover image: Study area for the Otway Exploration Drilling Program.

Revision	Description	Date	Originator	Reviewer	Approver
V0.1	Draft Report	04/12/2023	■	■	■
V1.0	Client comments incorporated and report finalised	02/01/2024	■		■

EXECUTIVE SUMMARY

ConocoPhillips Australia is planning to undertake exploration activities associated with offshore permits VIC/P79 and T/49P located in Commonwealth waters in the Otway Basin, between King Island and Portland, Victoria.

Cosmos Archaeology has been commissioned by to undertake a desktop maritime heritage assessment over the offshore permits and operational areas to identify known maritime heritage such as shipwrecks, plane wrecks and maritime infrastructure and to provide an assessment of the likelihood of encountering unknown anomalies.

The southern coast of Australia has been the main maritime thoroughfare for settlers, convicts, immigrants and traders since the earliest times of European settlement and continues to be through to today. When Bass Strait was officially discovered and named in 1798, it meant ships no longer had to travel around the southern tip of Tasmania, ensuring a potentially faster passage. However, the dangers of the Strait, with its shallow waters and numerous small islands made for a more treacherous journey.

Small sailing vessels travelled the southern coast of Victoria from the early 19th century and Portland Bay was first settled in 1834. Sealing and whaling were the prominent industries during these early years of settlement, however, both industries were already declining by the 1850s. Trading of wheat, alcohol potatoes and other goods was all transported through shipping, with vessels calling in at the various ports along the coast, often finishing their journeys at the large port of Melbourne.

The discovery of gold in the 1850s brought large numbers of immigrants to Victorian shores by larger and faster vessels and these vessels were soon operated by countries other than the British. The development of steam also brought larger vessels onto the main trading routes along the southern Australian coastline and through Bass Strait.

The journey was so treacherous, however, that sections of the Victorian coastline is now known as the 'Shipwreck Coast' due to the number of vessels that came to grief along the shore and towering cliffs. King Island too has a shipwreck trail with more than 60 recorded ships colliding with the fringing reefs and rocks surrounding the Island.

The two World Wars saw the Germans and the Japanese patrolling Australian waters, with the Germans laying mines in Bass Strait, which sank the MV *City of Rayville* off Cape Otway and SS *Cambridge* off the Gippsland Coast.

After WWII, the development of bulk container ships saw the smaller ports no longer being required as these much larger vessels required bigger port facilities for loading and unloading and less stops were more profitable for the shipping companies.

This desktop study has identified no known shipwrecks, aircraft wrecks or sea dumping sites within the study area. There is one potential shipwreck that may be in the vicinity of the study area. SS *Seljie* has several coordinates listed for its location, the closest of which is 6 km from the study area.

The review of the heritage databases and historical sources identified 12 shipwrecks that could potentially be located within the study area. The accuracy of the information detailing their wrecking location, and the coordinates assigned to specific wrecks in heritage databases, varies from case to case. It is considered possible that any of these wrecks, or none of them, may be located within the study areas. Note that the frequency of shipwrecks increases with proximity to shore and decreases further offshore where navigational hazards are less.

A further unknown number of shipwrecks can be expected to have occurred within the study area. These could be vessels not accounted for in the local historical sources; vessels not listed on the insurance registers; small coastal craft, to name a few.

Other items of maritime heritage including historical anchors, jettisoned cannon and other items lost overboard or transported to their location from a nearby shipwreck site could also be within the study area. The extensive use of the area and Bass Strait by shipping since colonial times, indicates there is potential for such items to be located within the study area.

If an item of underwater cultural heritage is discovered, it is a legal requirement to notify the Commonwealth heritage authorities with details of the find as soon as possible. The finds will then be evaluated by the relevant state practitioner in this case: Victoria for VIC/79P and Tasmania for T/49P.

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Abbreviations

ACMA	Australian Communications and Media Authority
AHS SD	Australian Hydrographic Service Sea Dumping Database
AUCHD	Australasian Underwater Cultural Heritage Database
CA	Cosmos Archaeology Pty Ltd
DCCEEW	Cth Department of Climate Change, Energy, the Environment and Water
EEZ	Exclusive economic zone
EP	Environment Plan
EPA	<i>Environmental Planning and Assessment Act (NSW) 1979</i>
GPS	global positioning system
HV	Heritage Victoria
IHO	Interim heritage order
.kmz	keyhole markup file
LAT	Lowest astronomical tide
LEP	Local Environmental Plan
MASoHI	Maritime Archaeology Statement of Heritage Impact.
MBES	multi-beam echosounder
MHA	Maritime Heritage Assessment
MODU	Mobile Offshore Drilling Unit
NSW MHD	NSW Maritime Heritage Database
RAAF	Royal Australian Air Force
RNE	Register of the National Estate
SHI	State Heritage Inventory
SHR	State Heritage Register
SSS	side scan sonar
TSB	Territorial Sea Baseline
UCH	underwater cultural heritage
UCHA	<i>Cwth Underwater Cultural Heritage Act 2018</i>
UXO	unexploded ordnance
VHR	Victorian Heritage Register
WWII	World War II

1 INTRODUCTION

1.1 Background

ConocoPhillips Australia is planning to undertake exploration activities associated with offshore permits VIC/P79 and T/49P located in Commonwealth waters in the Otway Basin, between King Island and Portland, Victoria. The proposed exploration activities will consist of site survey areas measuring 6 km x 6 km and will include the planned well sites, two relief well locations, and a maximum 2.5 km anchor array from the mobile offshore drilling unit (MODU) – consisting of a minimum of 8 and a maximum of 12 anchors subject to an accepted Environment Plan (EP).

Cosmos Archaeology (CA) has been commissioned by ConocoPhillips to undertake a desktop maritime heritage assessment over the offshore permits and operational areas to identify known seabed anomalies such as shipwrecks, plane wrecks and maritime infrastructure and to provide an assessment of the likelihood of encountering unknown anomalies.

Also, within scope, is a review of the planned marine geophysical data to provide a Maritime Archaeology Statement of Heritage Impact (MASoHI) for the proposed works.

1.2 Study Area

The study area encompasses the petroleum titles (VIC/P79 and T/49P) along with their associated operational areas (where those extend beyond the title boundaries) [Figure 1].

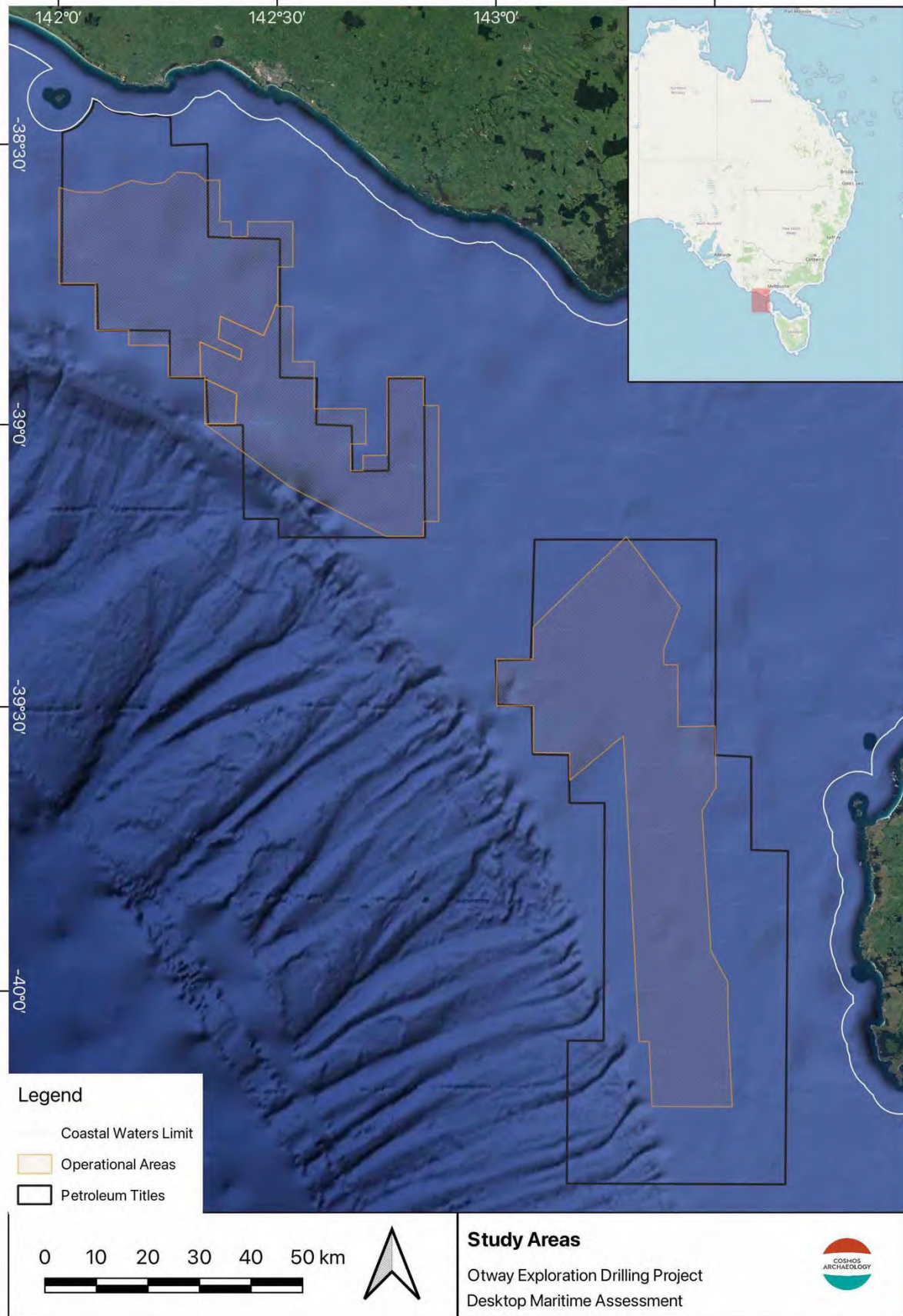


Figure 1: Location of petroleum title (VIC/P79 and T/49P) and associated operational areas.

1.3 Scope of the Study

The scope of this desktop maritime heritage study is to identify any known seabed anomalies that may be of historical significance or cultural in origin within the study areas.

These may include, as per the *Underwater Cultural Heritage Act 2018*, the location within the designated study areas of:

- (a) all remains of vessels that have been in Australian waters for at least 75 years.
- (b) every article that is associated with a vessel, or the remains of a vessel, and that has been in Australian waters for at least 75 years.
- (c) all remains of aircraft that have been in Commonwealth waters for at least 75 years.
- (d) every article that is associated with an aircraft, or the remains of an aircraft, and that has been in Commonwealth waters for at least 75 years.

This report does not assess:

- submerged Aboriginal sites or Aboriginal cultural values.

2 METHODOLOGY

This desktop assessment will be undertaken using the following approach:

- Consult a variety of sources as background to the desktop assessment. Research is confined to what is available online and in the consultant's library for information on known and potential maritime archaeological sites.
- Tabulate and map known and potential sites with an estimation of accuracy.
- Provide statements on the expected condition and detectability of the identified maritime archaeological remains.
- Review legislative requirements.

2.1 Sources

This desktop study has used various sources to prepare a list of known and potential shipwrecks, as well as other maritime archaeological sites in the study area (Table 1). Research is confined to what is available online and, in the consultant's extensive library.

Table 1: Historic resources consulted in this report.

Source	Description
<i>Australasian Underwater Cultural Heritage Database (AUCHD)</i>	The Australasian Underwater Cultural Heritage Database, maintained by the Commonwealth Department of Climate Change, Energy, the Environment, and Water (DCCEEW), is an online database of known and potential shipwrecks, aircraft wrecks and other maritime heritage sites and objects in Australian and Commonwealth waters.
<i>Australian Government Department of Defence and Australia Hydrographic Service – Sea Dumping in Australia (AHS SD)</i>	This database of sea dumping sites is managed by the Australian Government Department of Defence with information supplied by the Australian Hydrographic Service. http://www.hydro.gov.au/n2m/dumping/dumping.htm
<i>Australian Government Department of Defence UXO in Australia</i>	This database of sea dumping and UXO sites is managed by the Australian Government Department of Defence with information supplied from various sources including the Australian Hydrographic Service. https://uxo-map.defence.gov.au/
<i>Archival sources and heritage reports</i>	A review of a wide range of primary and secondary historical sources held by the National Library of Australia, the National Archives of Australia, and various published and unpublished heritage reports and articles.
<i>Previous reports completed by Cosmos Archaeology</i>	A review of reports on projects Cosmos Archaeology has conducted within the area of the study areas.

2.2 General statements on site locations

Few of the potential maritime archaeological sites presented in this study have accurate positions. This is because most of the shipwrecks and aircraft wrecks potentially situated in the study area have not been located and are known only from historical sources or heritage databases. Therefore, only broad areas within which they can be expected to be found can be presented with any confidence. As for the wrecks which have been located, designating accurate positions was not always possible as, in most cases, it is not known how their

positions were recorded, such as with global positioning systems (GPS) or a compass/sextant. Furthermore, positions of known wrecks may have been taken off maritime charts and, therefore, reductions in precision due to plotting and scaling could be expected. Coordinates provided in some databases could also have been inferred from vague historical accounts which in fact could place the site within a relatively large area. This issue is proportionately compounded for sites that are lost at increasingly greater distances from the coast of Australia.

GPS coordinates have become increasingly reliable, but it must be noted that positions recorded with GPS in the 1980s to 1990s had accuracies of 100-300 metres. Those sites found and recorded by GPS closer to shore are likely to have had their location updated over time, but sites further from the coast and/or less accessible may still be listed with old and inaccurate coordinates. There are also different geodetic datums used by GPS units, but if datum is not recorded with the coordinates this can lead to errors when using the same coordinates with a different datum. User error can also occur when a recorder, or someone copying the location records, interprets the coordinates in the wrong style, such as reading coordinates in degrees, minutes, seconds rather than degrees and decimal minutes for example. Based on these scenarios, it is safe to assume that there is always a degree of inaccuracy with the provision of site coordinates.

Australasian Underwater Cultural Heritage Database (AUCHD) ¹

The Commonwealth Underwater Cultural Heritage Database (AUCHD) is managed by the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW). The current database was launched in December 2009 and includes all known shipwrecks, aircraft and other maritime cultural heritage in Australian waters. At the time of the production of this report, the database contains information of:

- 10,461 shipwrecks of which 6,996 have been assigned geographic coordinates.
- 281 aircraft of which 194 have been assigned geographic coordinates; and
- 256 items of other maritime cultural heritage of which 158 items have locations (note these items include historic maritime infrastructure, dumping sites, monuments, museums, and natural features in addition to artefacts).

Information presented in the AUCHD is compiled from each of the State and Territory historic shipwreck agencies or supplied by collecting institutions holding historic shipwreck objects. The integrity or source of the information held by these agencies is unknown. The size of the area in which an individual wreck could be found varies depending on the historical information available. Some wrecks which have been found have a latitude and longitude position, but the accuracy of that position could not be determined as the method used in obtaining the position is not known.

¹ Department of Climate Change, Energy, the Environment, and Water, 2023, *Australasian Underwater Cultural Heritage Database*, available at <https://www.dcceew.gov.au/parks-heritage/heritage/underwater-heritage/auchd>.

Department of Defence – Unexploded Ordinance (UXO) in Australia ² and Australian Hydrographic Service – Sea Dumping (AHS SD)³

The locations of UXO and sea dumped materials are provided by the Department of Defence from various sources. Dumped materials of heritage value can include abandoned vessels and historic munitions, such as WWII-era aircraft components and Lend-Lease material.⁴ It is important to note that these locations are where the materials were designated to be dumped, but it has been found that those dumping the materials may not have been particular about the final location. An example of this was identified in a previous CA study that found the Narrabeen Dumping Ground, Sydney (a ships graveyard), despite having a high concentration of wrecks within its boundary, also had a dense concentration of sites between four to five kilometres to the east, outside of the designated dumping area.⁵

² **Department of Defence 2023**, *Unexploded Ordinance (UXO) in Australia* available at <https://uxo-map.defence.gov.au/>, accessed 21 November 2023

³ **Department of Defence and Australian Hydrographic Service, 2023**, *Sea Dumping in Australia*, available at <http://www.hydro.gov.au/n2m/dumping/dumping.htm>

⁴ **Cosmos Archaeology, 2014**, INPEX Ichthys LNG Project : Nearshore Development – Dredging. East Arm, Darwin Harbour, Northern Territory. Relocation of Heritage Objects and Removal of debris. Prepared for Tek Ventures Pty Ltd

⁵ **Cosmos Archaeology, 2007b**, Submarine Cable System, Landfall Option – Collaroy: Underwater Heritage Impact Assessment Baseline Review, report prepared for Patterson Britton and Partners.

3 LEGISLATION

3.1 Commonwealth Legislation

Commonwealth *Underwater Cultural Heritage Act 2018*

The Commonwealth *Underwater Cultural Heritage (UCH) Act 2018* (replacing the *Historic Shipwrecks Act 1976*) provides for the protection, conservation, and management of Australia’s historic shipwrecks, sunken aircraft, and other types of underwater cultural heritage.⁶ The Act is also designed to enable the cooperative implementation of national and international maritime heritage responsibilities, and to promote public awareness, understanding, appreciation, and appropriate use of Australia’s underwater cultural heritage.

Under Part 1, Division 2 of the *UCH Act 2018*, underwater cultural heritage is defined as “any trace of human existence that has a cultural, historical or archaeological character; and is located under water.” Traces of human existence are considered to be located under water whether they are located partially or totally under water, and whether they are under water periodically or continuously. A “trace of human existence” is further defined to include:

- (a) sites, structures, buildings, artefacts and human and animal remains, together with their archaeological and natural context; and
- (b) vessels, aircraft and other vehicles or any part thereof, together with their archaeological and natural context; and
- (c) articles associated with vessels, aircraft or other vehicles, together with their archaeological and natural context.

Seabed pipelines and cables, and other installations that are placed on the seabed and are still in use, are not considered to be underwater cultural heritage under the Act.

Different articles of underwater cultural heritage are, or can be, protected under the *UCH Act 2018*, depending on the kinds of articles, their heritage significance, and their location. Part 2, Division 1 of the Act provides that certain articles of underwater cultural heritage are automatically protected, including:

- (a) all remains of vessels that have been in Australian waters for at least 75 years.
- (b) every article that is associated with a vessel, or the remains of a vessel, and that has been in Australian waters for at least 75 years.
- (c) all remains of aircraft that have been in Commonwealth waters for at least 75 years.
- (d) every article that is associated with an aircraft, or the remains of an aircraft, and that has been in Commonwealth waters for at least 75 years.

These articles of underwater cultural heritage are automatically protected whether the existence or location of the article is known, and even if the article is or has been removed from Australian or Commonwealth waters – after the passage of 75 years.

The term “associated with” is defined under Part 1, Division 2 of the Act whereby an article is considered to be associated with a vessel, aircraft, or other vehicle if the article:

- (a) appears to have formed part of the vessel, aircraft or other vehicle; or
- (b) appears to have been installed or carried on the vessel, aircraft or other vehicle; or
- (c) is remains of humans or animals that appear to have been on board the vessel, aircraft or other vehicle; or

⁶ Commonwealth of Australia, 2018, *Underwater Cultural Heritage Act 2018*, available at <https://www.legislation.gov.au/Details/C2018A00085>, accessed 4 December 2023.

(d) appears to have been constructed or used by a person associated with a vessel.

“Australian waters” and “Commonwealth waters” have different meanings under the *UCH Act 2018* (Part 1, Division 2), whereby “Australian waters” extend from the seaward limits of a State to the outer limit of Australia’s continental shelf, and “Commonwealth waters” extend from waters 3 nautical miles seaward of the Territorial Sea Baseline adjacent to the States and the NT – i.e., beyond State or Territory coastal waters – to the outer limit of Australia’s continental shelf. Specifically, under Part 1, Division 2 of the Act:

“Australian waters” means:

- (a) any waters on the landward side of the territorial sea of Australia that are not within the limits of a State; and
- (b) the territorial sea of Australia; and
- (c) the sea above the continental shelf of Australia; and
- (d) the seabed and subsoil beneath any such sea or waters.

“Commonwealth waters” means:

- (a) the territorial sea of Australia, other than coastal waters of a State or the Northern Territory; and
- (b) the sea above the continental shelf of Australia; and
- (c) the seabed and subsoil beneath any such sea or waters.

The Territorial Sea Baseline generally corresponds with the low water line along the coast, measured to the level of Lowest Astronomical Tide. However, in some cases, straight baselines have been established in areas where the coastline is deeply indented and cut into, or where there is a fringe of islands along the coast in its immediate vicinity.

The study areas are situated within “Commonwealth waters” as defined in the *Underwater Cultural Heritage Act 2018*, and as such, shipwrecks, aircraft wrecks and all associated articles that have been in the water for over 75 years are automatically protected (Figure 2).

Part 3, Division 2 of the *Underwater Cultural Heritage Act 2018* provides for the regulation of activities relating to protected underwater cultural heritage. Specifically, any conduct that has or is likely to have an adverse impact on protected underwater cultural heritage is prohibited unless carried out in accordance with a permit granted under the Act. Conduct is considered to have an adverse impact on protected cultural heritage if it:

- (a) directly or indirectly physically disturbs or otherwise damages the protected underwater cultural heritage; or
- (b) causes the removal of the protected underwater cultural heritage from waters or from its archaeological context.

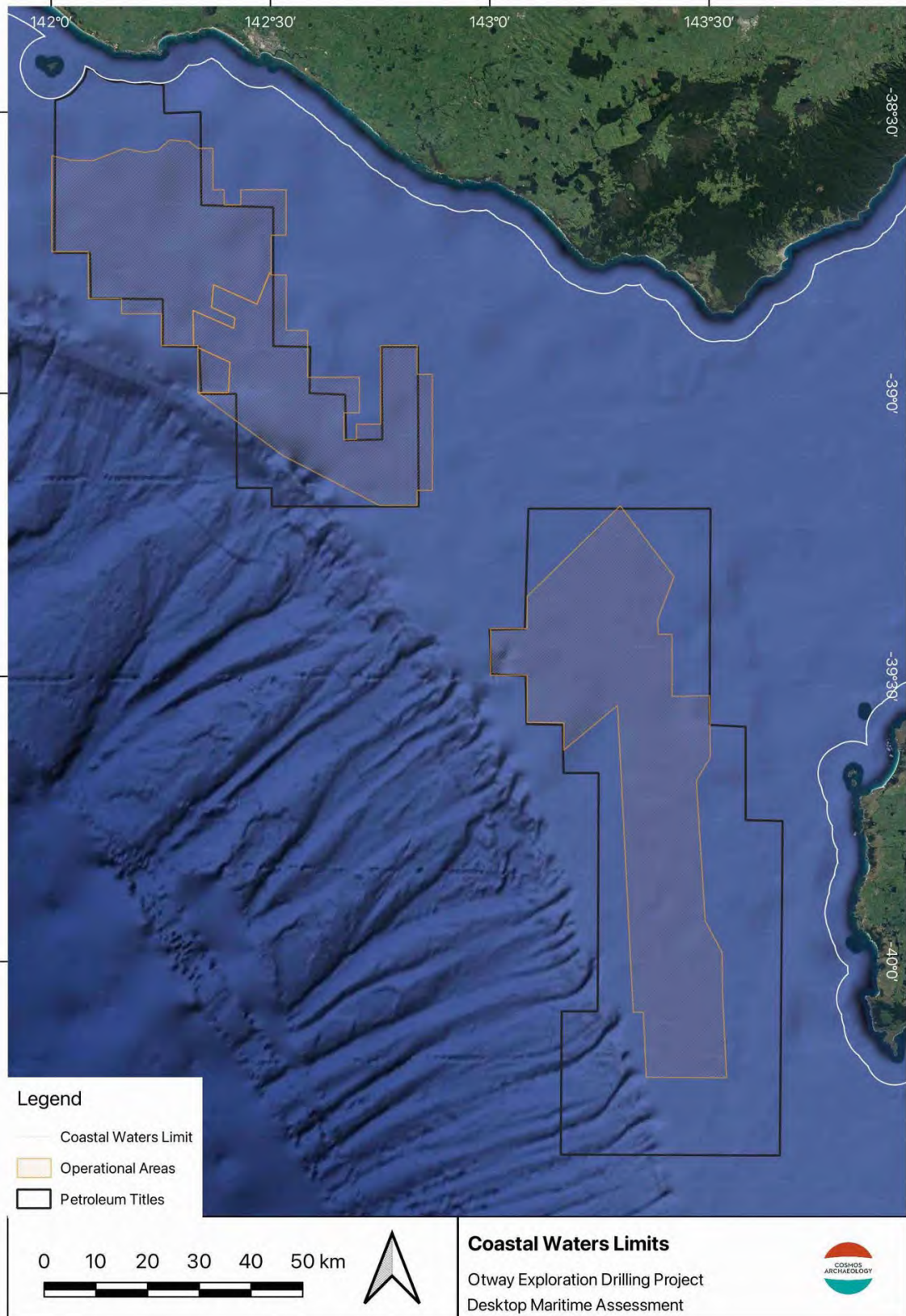


Figure 2: The study area is located seaward of the coastal waters boundary of both Victoria and King Island.

3.1.1 ***Environment Protection and Biodiversity Conservation Act 1999***⁷

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the principal environmental Act at a Commonwealth level. Australia is one of only a few countries worldwide that has enacted legislation to implement its obligations under the World Heritage Convention. The EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regs) focuses Government interests on the protection of matters of national environmental significance, with the states and territories having responsibility for matters of State and local significance. Matters of national environmental significance include but are not limited to flora, fauna, ecological communities and heritage places of national and international importance.

The EPBC Act requires approval from the Minister for actions with a significant impact on places included on the World Heritage List or Commonwealth Heritage List, which may include maritime and underwater heritage.

There are no sites on the World, National or Commonwealth lists within the study area.

3.2 Heritage policies relevant to maritime cultural heritage

3.2.1 ***UNESCO Convention on the Protection of Underwater Cultural Heritage***

The United Nations Educational, Scientific and Cultural Organization (UNESCO) 2001 *Convention on the Protection of the Underwater Cultural Heritage* is an international treaty that was developed to provide a common framework for States Parties on how to better identify, research, and protect underwater heritage whilst ensuring its preservation and sustainability. The UNESCO 2001 *Convention* consists of a main text that sets out basic principles for the protection of underwater cultural heritage and provides a detailed State cooperation system, and an Annex that outlines widely recognised practical rules for the treatment and research of underwater cultural heritage. The UNESCO 2001 *Convention* entered into force in 2009.

The Commonwealth of Australia supported the principles and drafting of the UNESCO 2001 *Convention* and is currently considering ratification of the Convention in accordance with requirements under Australia's *Treaty Making Guidelines*. The *Underwater Cultural Heritage Act 2018* was also developed specifically to align with the UNESCO 2001 Convention.

In 2010, the Commonwealth, States, and the NT signed the *Australian Underwater Cultural Heritage Intergovernmental Agreement* that would enable the Australian Government to ratify the UNESCO Convention 2001, should it so choose. One of the key aims of the Agreement is for all parties to meet internationally recognised best practice management of Australia's underwater cultural heritage as outlined in the Rules in the Annex to the UNESCO 2001 *Convention*.

The main principles of the UNESCO 2001 Convention are as follows:

- **Obligation to Preserve Underwater Cultural Heritage** – States Parties should preserve underwater cultural heritage and act accordingly. This does not mean that States would necessarily have to undertake archaeological excavations; they only have to take measures according to their capabilities. The Convention encourages scientific research and public access.

⁷ **Department of Climate Change, Energy, the Environment, and Water 2023**, *Australia's National Heritage List*, available at <https://www.environment.gov.au/heritage/places/national-heritage-list>, accessed 21 November 2023; and **Department of Climate Change, Energy, the Environment, and Water 2023**, *Australia's Commonwealth Heritage List*, available at <https://www.environment.gov.au/heritage/places/commonwealth-heritage-list>, accessed 21 November 2023.

- *In Situ* Preservation as first option – The *in-situ* preservation of underwater cultural heritage (i.e. in its original location on the seafloor) should be considered as the first option before allowing or engaging in any further activities. The recovery of objects may, however, be authorized for the purpose of making a significant contribution to the protection or knowledge of underwater cultural heritage.
- No Commercial Exploitation – The 2001 Convention stipulates that underwater cultural heritage should not be commercially exploited for trade or speculation, and that it should not be irretrievably dispersed. This regulation is in conformity with the moral principles that already apply to cultural heritage on land. It is not to be understood as preventing archaeological research or tourist access.
- Training and Information Sharing – States Parties shall cooperate and exchange information, promote training in underwater archaeology and promote public awareness regarding the value and importance of underwater cultural heritage.

The 36 Rules of the Annex to the Convention present an operating methodology for underwater works associated with UCH and this is a global reference document for underwater archaeology. A Manual for Activities directed at UCH is also provided to guide immediate and long-term management of UCH.

3.2.2 Charter on the Protection and Management of UCH ICOMOS 1996⁸

The Charter outlines the principles for protecting and managing UCH. These principles include (but are not limited to):

- *The preservation of UCH in situ should be considered as a first option.*
- *Non-destructive techniques should be considered and encouraged in preference to excavation.*
- *Investigation must not adversely impact UCH more than is necessary for the mitigation of the impact.*
- *Investigation must be accompanied by adequate documentation.*

3.2.3 Guidelines for the Management of Australia's Shipwrecks⁹

The *Guidelines for the Management of Australia's Shipwrecks* was produced as a combined publication by the Australian Institute for Maritime Archaeology Inc. (now the Australasian Institute for Maritime Archaeology) and the Australian Cultural Development Office (now the Australian Government Department of Climate Change, Energy, the Environment and Water) in 1994.

The guidelines comprise principles and practices that have been adopted by Australia's professional maritime archaeologists and serve as useful modules for other groups. The document includes a Statement of Principles governing the broad approach to be taken when dealing with historic shipwreck sites and related archaeological collections.

⁸ **ICOMOS 1996**, *Charter on the Protection and Management of Underwater Cultural Heritage*, available at <https://www.icomos.org/en/faq-doccen/179-articles-en-francais/ressources/charters-and-standards/161-charter-on-the-protection-and-management-of-underwater-cultural-heritage>, accessed 21 November 2021.

⁹ **Australian Institute for Maritime Archaeology. Special Projects Advisory Committee & Australian Cultural Development Office & Australian Institute for Maritime Archaeology 1994**, *Guidelines for the management of Australia's shipwrecks*, Australian Institute for Maritime Archaeology and the Australian Cultural Development Office, Canberra.

4 KNOWN AND POTENTIAL MARITIME ARCHAEOLOGY

4.1 Maritime Background of the study area

4.1.1 Early Exploration and trade

It was the master of the wreck of the *Sydney Cove* on Preservation Island in 1797, that first suggested there might be a strait between New South Wales and Tasmania (Van Diemen's Land). He thought the south westerly swell coupled with the tides and currents indicated Preservation Island was in a channel that linked the Pacific and Southern Indian Oceans. George Bass was given permission by Governor Hunter to search for it and first attempted to find the strait in an open Sydney-built whale boat.¹⁰ While he never actually entered the Strait during this voyage, he did concur that it existed from the swell he encountered. In 1798, he and Matthew Flinders, in the sloop *Norfolk*, circumnavigated Tasmania and confirmed it was an Island.¹¹

Bass Strait's western boundary is defined by King Island in the west and the Furneaux Islands in the east. The Strait is 500 km long and 250 km wide and is relatively shallow, averaging 50 m – 70 m. Its shallowness and the many small islands that exist in the Strait, can make sea conditions treacherous for vessels travelling through the southern Australian trading route. However, the discovery of the Strait also considerably shortened sailing time and increased accessibility to budding coastal settlements in the early colony, particularly along the southern coastline of Victoria.

In December 1800, Captain James Grant in the *Lady Nelson*, on the order of the Duke of Portland had explored the coast of Victoria and named Portland Bay, Cape Albany Otway and Cape Schank. He was the first to cross through Bass Strait from west to east.¹²

Bass had reported the large seal colonies along the Victorian coast during his explorations. Sealing ships and whaling vessels began plying Bass Strait and the coastal waters of Victoria often setting up temporary camps along the coastline as required.¹³ As the seal population declined, whaling replaced sealing as the major industrial activity along the Victorian coastline.¹⁴

In 1834, the first permanent Victorian European settlement was established at Portland Bay by Edward Henty. Up until this date, the area had been used by whalers as a base and whaling continued to be the main commercial industry well in to the 1840s (Figure 3).¹⁵ Portland Bay offered a deep sheltered harbour, unless gales blew in from the southwest. After 1835 vessels would arrive with livestock and supplies and leave with oil, wool and whalebone. By 1841, Portland was receiving immigrants. A government jetty was built in 1846 but it did not extend far enough, and lighters still had to ferry goods out to the bigger ships in deeper water (Figure 4).¹⁶

¹⁰ Macrae Bowden, K. 2006 *George Bass (1771 – 1803)* in the Australian Dictionary of Biography, available at <https://adb.anu.edu.au/biography/bass-george-1748>.

¹¹ Cooper, H. M., 2006 *Matthew Flinders (1774 – 1814)* in the Australian Dictionary of Biography, available at <https://adb.anu.edu.au/biography/flinders-matthew-2050>.

¹² McCartin, A. 2006 *James Grant (1772 – 1883)* in the Australian Dictionary of Biography, available at <https://adb.anu.edu.au/biography/grant-james-2117>.

¹³ Department of the Environment, 2015, South-east marine region profile: A description of the ecosystems, conservation values and uses of the South-east Marine Region, Commonwealth of Australia 2015

¹⁴ Op. Cit. Department of the Environment, 2015, p. 61.

¹⁵ State Library of Victoria, 2023 *Victoria's early history 1803 – 1851* available at <https://guides.slv.vic.gov.au/Victoriasearlyhistory/timeline>.

¹⁶ Op. Cit., Barnard, J. 2008, p. 16.

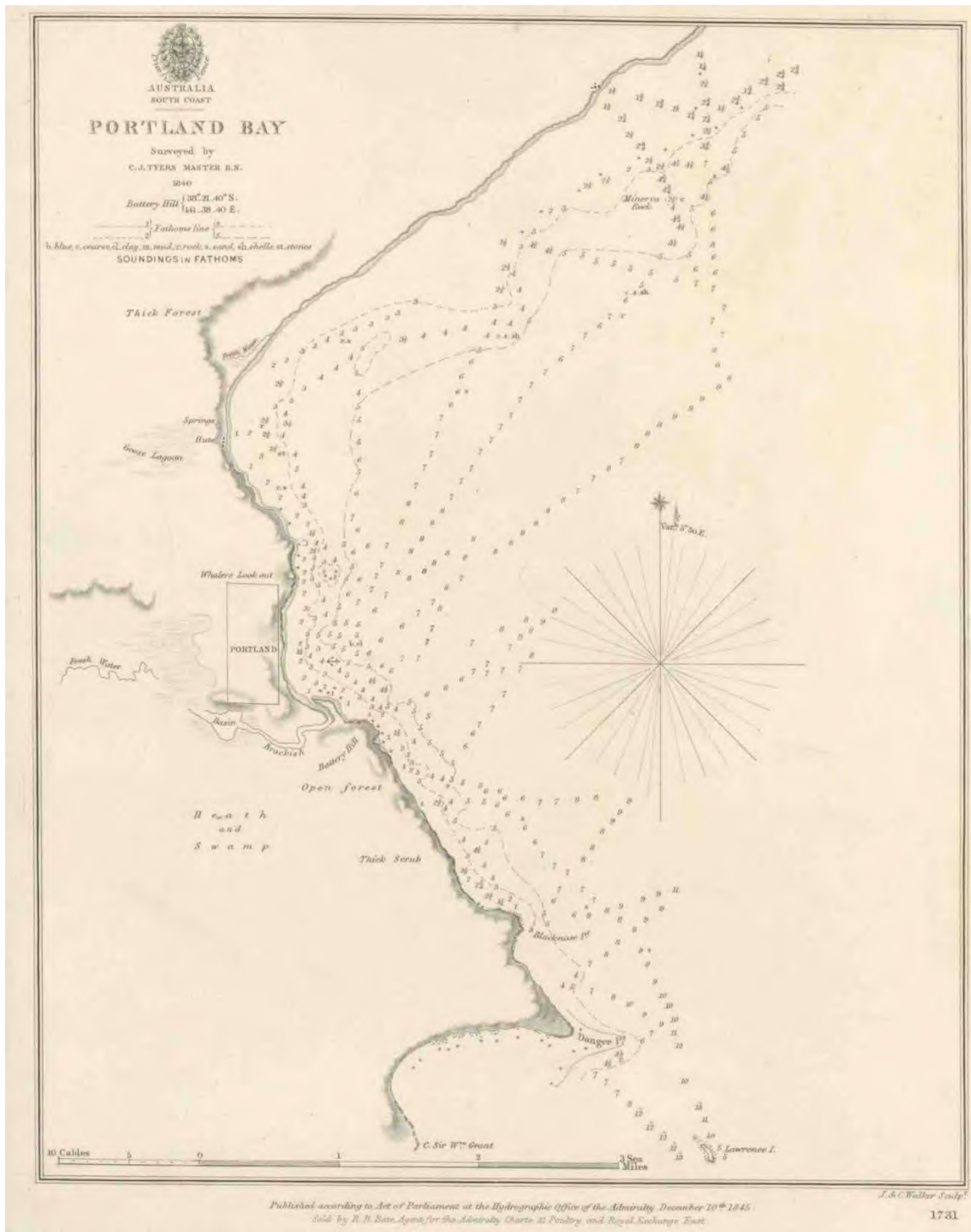


Figure 3: Portland Bay 1840, six years after Edward Henty permanently settled Portland.¹⁷

¹⁷ Great Britain. Hydrographic Dept & Bate, R. B & Tyers, C. J & J. & C. Walker. 1845, *Australia, South Coast, Portland Bay* Published according to Act of Parliament at the Hydrographic Office of the Admiralty ; Sold by R. B. Bate, agent for the Admiralty charts, 21 Poultry and Royal Exchange East, [London] viewed 28 November 2023 <http://nla.gov.au/nla.obj-233815684>



Figure 4: By 1863, several jetties had been built to service shipping imports and exports.¹⁸

Port Fairy too attracted many sealers and whalers, although the whaling station closed in the 1840s due to an exhausted supply of whales. However, Port Fairy continued to flourish due to the rich soils and commercial opportunities and by 1857, Port Fairy was one of the busiest ports in the colony, second only to the Port of Melbourne (Figure 5).¹⁹

¹⁸ Victoria. Department of Crown Lands Survey, 1863, Municipality of Portland [cartographic material]. Melbourne: Dept. of Crown Lands and Survey.

¹⁹ InVictoria, 2023 *Port Fairy: history and heritage*, available at <https://port-fairy.com/history-and-heritage#:~:text=The%20area%20attracted%20many%20sealers,island%20now%20bears%20his%20name.>

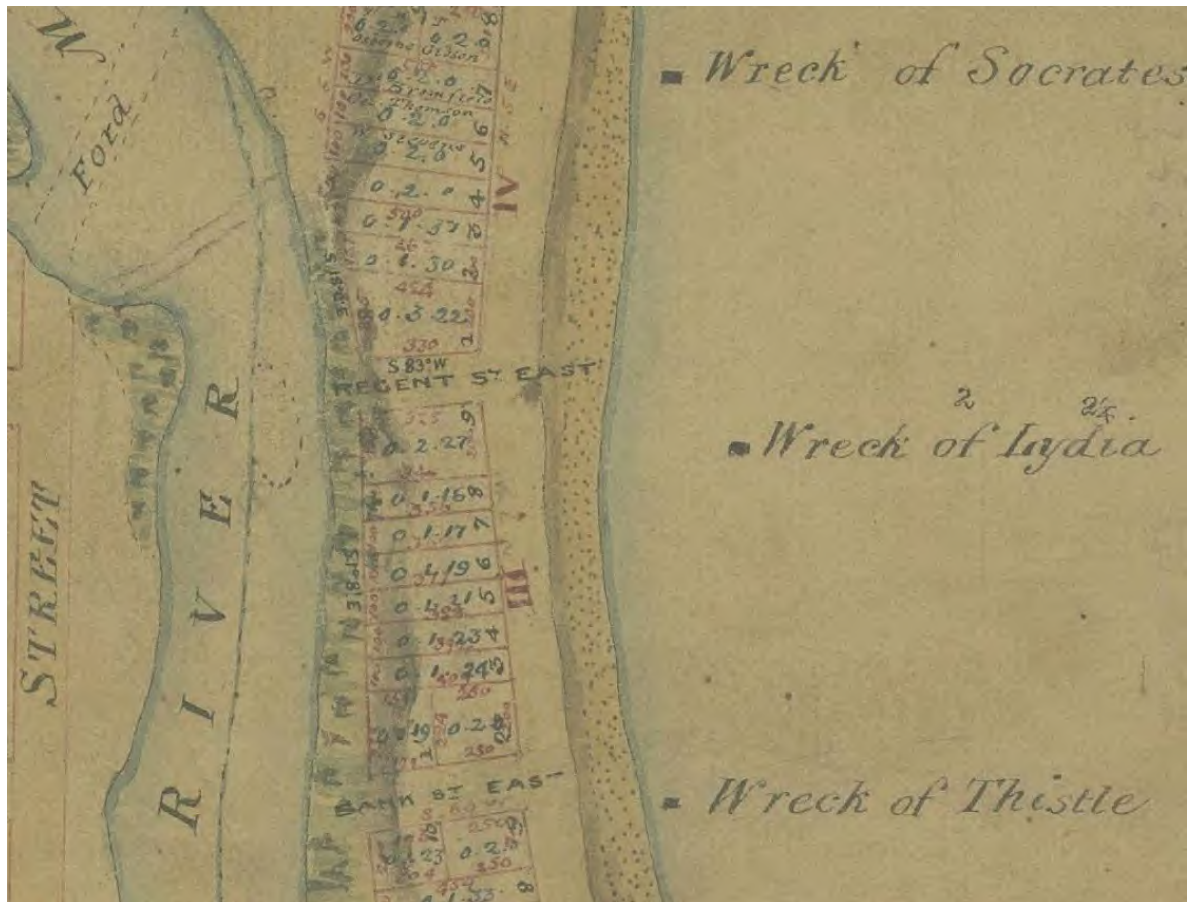


Figure 5: Excerpt from map of Belfast (Port Fairy) 1851 showing wrecks already charted along the coast.²⁰

4.1.2 Development of maritime shipping

Since Melbourne was officially settled in the 1830s, the settlement relied heavily on shipping as did the wider Victorian economy. Melbourne depended on overseas and coastal shipping for economic growth. Pre-gold rush small and relatively slow vessels provided irregular voyages to and from Britain bringing immigrants. In the early years these voyages could take as long as 130 days. The sea was the main means of transport for the early Victorian settlements. Not only did it provide transport routes, but it also provided a means to make money by transporting livestock, timber, building materials, furniture, clothing and alcohol. Official orders, laws and news from other colonies were all carried by ships, and it was from the sea that the early colonial governments feared foreign threats would come.²¹

Prior to 1849, British Navigation Acts dictated who could serve the Australia trade. Any vessel transporting passengers and/or cargo had to be built in a shipyard belonging to the British Empire and manned by a British crew. Australian exports could only be shipped in British ships and coastal shipping was also controlled by the British.²² The number of vessels arriving in Australia was linked to growing number of immigrants receiving assisted passage, which therefore encouraged ship-owners to enter the market.

²⁰ Anon 1851 *Belfast Town*. SYDNEY B3, Port Fairy (T) [microform]

²¹ Barnard, J. 2008, *Jetties and Piers*. A background history of maritime infrastructure in Victoria. Published by the Heritage Council of Victoria, p. 12.

²² Various, 2008 *Melbourne shipping*, Encyclopedia of Melbourne. Published by University of Melbourne, available at <https://www.emelbourne.net.au/biogs/EM01366b.htm>.

Pre-gold rush, coastal shipping was relatively primitive, largely confined to the Sydney to Melbourne run and Melbourne to Portland. When news of the discovery of gold in Victoria reached London, an immediate demand for a swift journey to Australia brought larger, swifter ships to southern Australian shores – it is estimated that 86,000 people arrived in Australia to find their fortune.²³ Melbourne and other coastal ports became major hubs following discovery of Victorian gold in the early 1850s.

The British Navigation Act was demolished in 1849 which allowed foreign-built vessels to trade in the Australian colony. This saw the fast American clipper ships arriving which reduced the amount of time it took to travel from Europe to Australia, almost by half.

Steam ships however took longer to arrive on Australian shores than in Europe. Sailing ships were cheaper to construct and had larger cargo holds without having to cater for the space for engines or coal bunkers. Access to coal on long haul journeys was also a drawback. Steamship improvements during the 1860s through to the 1880s including the introduction of the triple-expansion engine enabled steamships to carry enough coal and the opening of the Suez Canal in 1869 reduced the travel time considerably.

In Australia, however, sailing ship design was the priority. Composite craft (iron framed and timber planked) and iron hulled ships proved themselves just as competitive in the export market, interstate and intrastate trade. By the late 1870s, however, steam was becoming the main means of propulsion of most vessels in the Australian maritime trade and by the 1880s, 85% of ships entering Melbourne from both overseas and interstate were steam driven.²⁴

4.1.3 *The treacherous coast*

The southwest coastline of Victoria was rough and treacherous and the long stretch between Moonlight Head and Port Fairy is now called the Shipwreck Coast. Port Fairy is at the western end and twenty ships are recorded as having been lost there between 1836 and 1876.²⁵ Warrnambool's Lady Bay has 15 recorded shipwrecks from 1850 to 1914. The *Loch Ard* (1878) ran aground onto Mutton Bird Island in a sea mist, with only two survivors, while the *Schomberg* (1855) ran aground at Curdies Inlet. The captain was entertaining the ladies below decks at the time. The last recorded major shipwreck along this stretch of coast was the *Antares*, sailing from Marseilles to Melbourne during WWI and sinking with all hands. Portland, while further west of the shipwreck coast has 19 recorded shipwrecks in Portland Bay. These are mostly smaller vessels, carrying immigrants, timber, whaling products, potatoes, clothing and alcohol. Many still have not been located.²⁶

From the 1830s, interstate shipping to and from colonial ports on the southern, western, and eastern coasts of Australia travelled through the notoriously rough Bass Strait, a journey that was 600 nm shorter than going around the south of Tasmania. Bass Strait is studded with islands, shoals, and reefs, which has produced a disproportionately large number of shipwrecks away from the mainland. In the west, vessels had to navigate between Cape Otway and King Island and the strong winds and currents of the Strait spelled disaster for many. There are over 60 ships recorded as having wrecked on King Island alone.²⁷ The idea of the installation of navigational aids and the construction of lighthouses to reduce the loss

²³ *Op. Cit. Various, 2008.*

²⁴ *Op. Cit. Various, 2008.*

²⁵ **Heritage Council of Victoria, n.d.**, *Guide to the Historic Shipwreck Trail on Victoria's West Coast*. Department of Planning and Community Development.

²⁶ *Op. Cit.*, **Heritage Council of Victoria, n.d.**,

²⁷ **DCCEEW, 2023** *Australasian Underwater Cultural Heritage Database*, available at <https://www.environment.gov.au/shipwreck/public/maps/shipwreck-map-search-load.do>, accessed 27 November 2023.

of shipping began in the 1830s, although it took another decade before the first lighthouse was built.²⁸

In 1835, the convict ship *Neva* was wrecked on King Island and 300 lives were lost. A parliamentary committee recommended a light be placed on King Island, however several more shipwrecks in the vicinity and the loss of the immigrant ship *Cataraqui* with 414 lives in 1845 would occur before the idea morphed into action (Figure 6). King Island has a maritime trail that tells the story of at least 7 shipwrecks that have come to grief on the island including:

- *Blencathra* (1875)
- *British Admiral* (1874)
- *Cataraqui* (1845)
- *Loch Leven* (1871)
- *Netherby* (1866)
- *Neva* (1935)

The first lighthouse to help protect this part of the coast was built at Cape Otway and was finally erected in 1848.²⁹



Figure 6: Hand tinted wood engraving of the Emigrant ship 'Cataraqui', King Island 1845 by Julian Ashton c 1887.³⁰

²⁸ Australian Government, n.d., 'Early Australian shipwrecks', [Online] <http://www.australia.gov.au/about-australia/australian-story/early-austn-shipwrecks>, accessed 21 November 2023.

²⁹ *Op. Cit.*, Barnard, J. 2008, p. 17.

³⁰ Aston, J. c1887, *Wreck of the Emigrant Ship "Cataraqui" on King Island 1845*. First published in The Picturesque Atlas of Australasia 1886 – 1888.

4.1.4 Defence Activities

The outbreak of World War I in 1914 brought the threat of war to Australia for the first time. The development of long distance, armed vessels coupled with the ability to deploy floating sea mines meant Australian waters were reachable. Two of the main trading cargos for Australian settlements, coal and wheat, were considered important to the war effort and made trading vessels vulnerable to attack. Coastal steamers were withdrawn from interstate services and pressed into war services, either as troop transfer ships or participating in convoys transporting goods to Britain. The interstate and coastal trade never fully recovered before World War II broke out in 1939.

As had happened in World War I, German raiders were active in Australian waters during World War II, and from 1942 Japanese submarines were also patrolling. Early in the war, German naval forces covertly laid mines in Bass Strait. The German navy utilised the captured Norwegian tanker ship, *Storstad*, to lay mines off Wilsons Promontory and Cape Otway in late October 1940. The mines laid by *Storstad* were responsible for sinking the British steamer *Cambridge*, two-and-a-half miles south of Wilsons Promontory on 8 November 1940. Less than 24 hours later, the American merchant ship, *City of Rayville* was sunk off Cape Otway. The Naval Board closed Bass Strait to shipping and began minesweeping operations, eventually removing a total of twelve mines from two minefields. Although the minesweeping operation was considered successful, and Bass Strait was quickly reopened for shipping, mines continued to wash ashore in subsequent years.³¹

4.1.5 Post WWII shipping

Post-WWII advances in technology saw the size of international carriers increase dramatically and from the 1960s large container and bulk ships began visiting Victorian ports. These large vessels and their containers transformed port facilities. These large ships had to travel further off the coast and their size meant they could not call into smaller coastal trading ports. It brought an end to small coastal trading vessels that were forced to sail close to the treacherous waters near the coast. These coastal waters are now used predominantly by fishing trawlers and pleasure craft.

4.1.6 Summary of cultural activities within the study area

From the review of the known history of the study area, the following activities were identified as previously and/or currently occurring across Bass Strait:

- Colonisation and the development of ports and harbours.
- Fishing, sealing, and whaling.
- Intrastate and interstate shipping.
- WW II defensive activities.
- International shipping, and
- Sea dumping of ammunition, chemicals and other items.

³¹ Hermon, Gill G 1957, *Volume I: Royal Australian Navy, 1939 - 1942*. pg. 270-271.

4.2 Known Maritime Archaeological Sites within the study area.

4.2.1 Shipwrecks

Review of the Commonwealth underwater cultural heritage database (UCHD) and the Victorian Heritage Database (VHD) did not identify any known shipwrecks within the study area.

There is one recorded shipwreck potentially within the vicinity of the study area. On 30 March 1929 the Norwegian owned 6598-ton S.S. *Seljie* had departed Melbourne and had just cleared Cape Otway on a course to Cape Leeuwin, Western Australia. The vessel was carrying a cargo of wheat with a destination of Las Palmas, Canary Islands. Weather conditions were reported as clear, and the Cape Otway lighthouse was seen clearly. At approximately 9.25pm, the Third Officer of the *Seljie*, Erling Thorsen, saw the lights of the inward bound Union Steamship Company's SS *Kaituna* which appeared to be correctly coming along the portside. Before long however the *Kaituna*'s lights appeared on the starboard side and very close.

At approximately 10:05 pm the bow of the *Kaituna* crashed into the *Seljie* between No. 5 and No. 6 holds and the *Seljie* was reported as opening as if it had been torpedoed.³² All the crew of *Seljie* were transferred to *Kaituna* and that vessel made it Melbourne under its own steam despite being damaged. SS *Seljie* sank in less than 22 minutes. The subsequent Marine Board Inquiry laid the blame largely on the captain of the *Kaituna*.

The site of SS *Seljie* has been located but not inspected. However, there are three different coordinates, recorded from different sources (Figure 7). The vessel was provisionally protected in 2002 (before it was old enough to fall under automatic protection) due to concerns that technical divers were illegally salvaging the wreck. This location was an estimate provided by the Navy and the one used to place the wreck under legislative protection.

The AUCHD has the wreck site lying approximately 6 km to the west of the 2002 position. A third position, provided by a Victorian technical diver, has the vessel a further 30 km to the southwest, placing it potentially 6 km to the east of VIC/P79.³³

This category does not include vessels known, or thought, to have sunk in the study area, but without a definite wreck location. See **Section 4.3.1** for a discussion of these shipwrecks.

³² Anon 1929 'FOUNDERING OF SELJE', *The Argus* (Melbourne, Vic.:1848 - 1957), 1 April, p. 8., viewed 28 Nov 2023, <http://nla.gov.au/nla.news-article3992522>

³³ Pers. Comms, Danielle Wilkinson email with author (27 November 2023, 3:48 pm) Re: *Shipwreck advice for Otway Gas Drilling*.

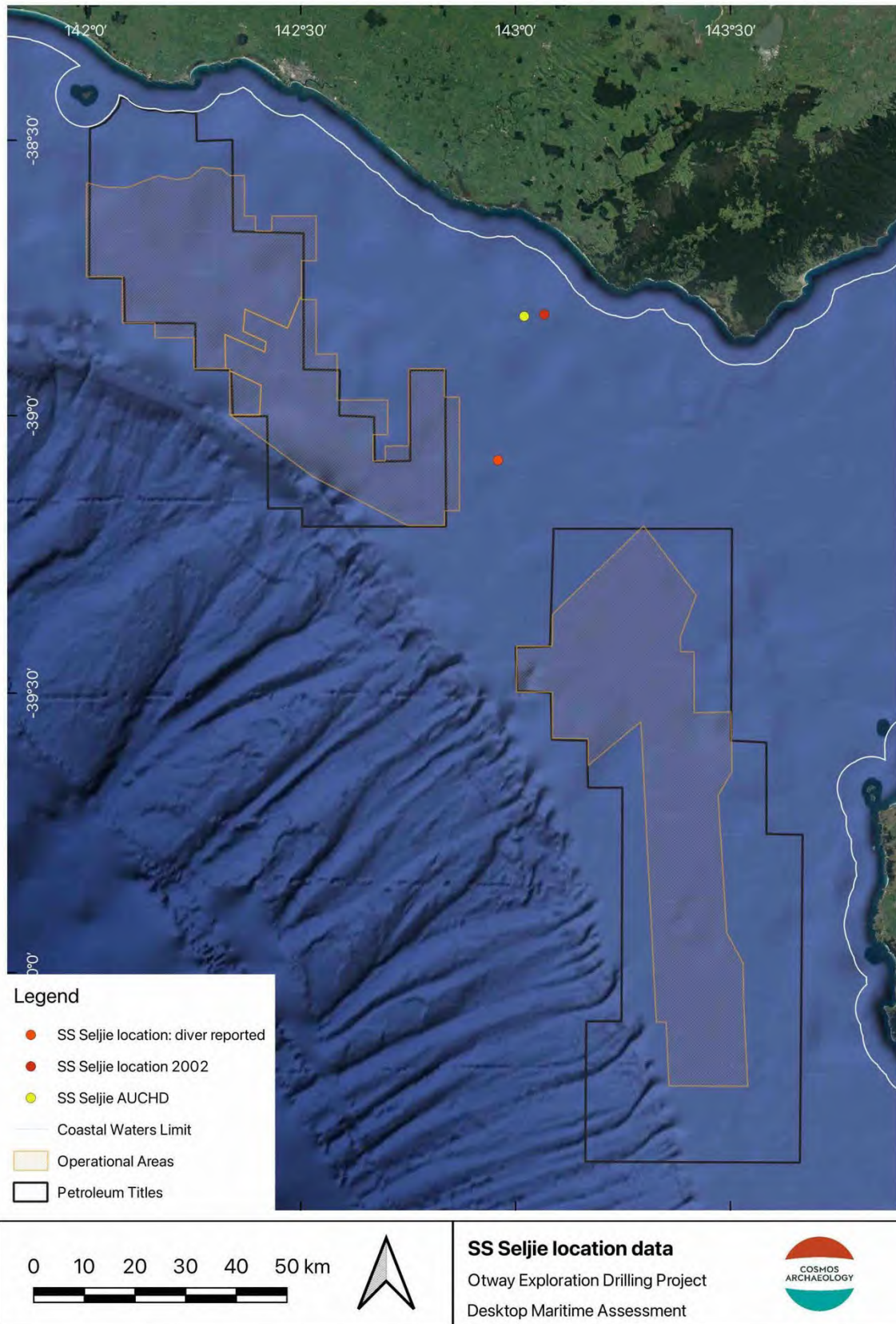


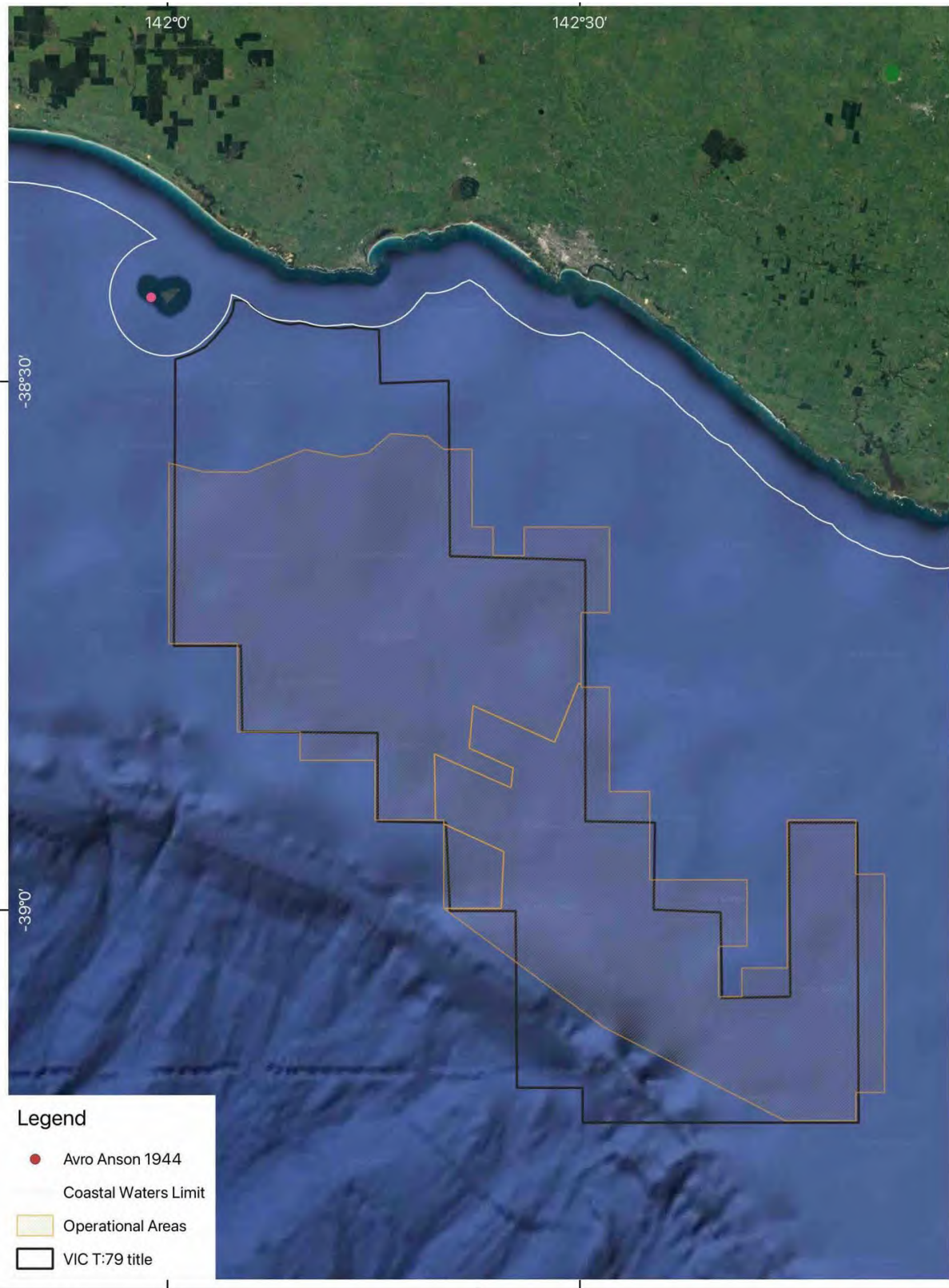
Figure 7: Three location coordinates available for SS Seljie.

4.2.2 *Aircraft wrecks*

The desktop research for this report did not find any information on known aircraft wrecks lost within the study area. There is one known aircraft wreck known to have crashed in the vicinity of the study area: a twin-engine Avro Anson lost near Lady Julia Percy Island in 1944 (Figure 8).

On 15 February 1944, Avro Anson AW-878 of 2 Air Observer's School took off from Mount Gambier airfield in South Australia to carry out a navigation exercise. They were to fly from Mount Gambier to Douglas Point and then back to Mount Gambier. When the aircraft did not return to base and had made no contact, overdue signals were sent out and aircraft debris was seen on Lady Julia Percy Island. A fishing boat found small pieces of wreckage spread over a 3-mile area. The next day further wreckage was pulled from the sea including the wing tips, port aileron, the gunner's cockpit door and a Mae West life preserver. The four airmen on board have never been recovered. A memorial stone and bronze plaque commemorates the wreck and the missing airmen.³⁴

³⁴ **Dunn, P., 2020**, *Crash of an Avro Anson into Sea near Lady Julia Percy Island off the southwest coast of Victoria on 15 February 1944*. Article on Oz at War, available at <https://www.ozatwar.com/ozcrashes/vic181.htm>, accessed 27 November 2023.



0 10 20 30 km

Avro Anson 1944 location
Otway Exploration Drilling Project
Desktop Maritime Assessment

Figure 8: Location of Avro Anson wreck site 1944 from UCHD.

4.2.3 Sea dumping

Military ordnance related to a shipwreck or aircraft which has been underwater more than 75 years has the potential to represent an item of UCH. Ordnance that does not relate to a shipwreck may still be assessed as significant if it meets the threshold for significance under the Commonwealth significance criteria (See Section 4.4). Therefore, any ordnance or sea dumping site from WWII or earlier has the potential to be significant UCH and may require further assessment.

There are no known sea dumping sites within the study areas, however there are four known locations within the vicinity (Table 2 and Figure 9).

Table 2: Sea Dumping sites within vicinity of study areas.³⁵

Name	Type	Details	Centre Coordinates (WGS 84)	Size (diameter)	Distance from study area	Source
SDG 110 Bass Strait	Ammunition	Includes 2331 boxes of detonators and 144 boxes of explosives.	-39.0292°, 142.3349°	2 km	2.8 km	AHS SD / Dept. of Defence
SDG 087 King Island	Ammunition	Cartridges, projectiles and fuses.	-39.6979°, 142.8767°	1.8 km	32 km	AHS SD / Dept. of Defence
SDC006 off King Island	Chemical munitions	1,634 tonnes of chemical ammunitions. ³⁶	-39.7513°, 142.5551°	11.5 km	55 km	AHS SD / Dept. of Defence
SDG 136 Victorian Coast	Ordnance and other items	Site of post WWII dumping.	-39.7513°, 142.5551°	19 km	60 km	AHS SD / Dept. of Defence

³⁵ **Plunkett, G., 2003** *Sea Dumping in Australia: Historical and Contemporary Aspects*, Department of Defence, Australia, available at <https://www.hydro.gov.au/n2m/dumping/seadumping.pdf>

³⁶ **Plunkett, G., 2018**, *Chemical Munitions Sea Dumping off Australia*, Department of Defence, Australia. Available at <https://www.hydro.gov.au/n2m/dumping/chemical.pdf>, p. 26

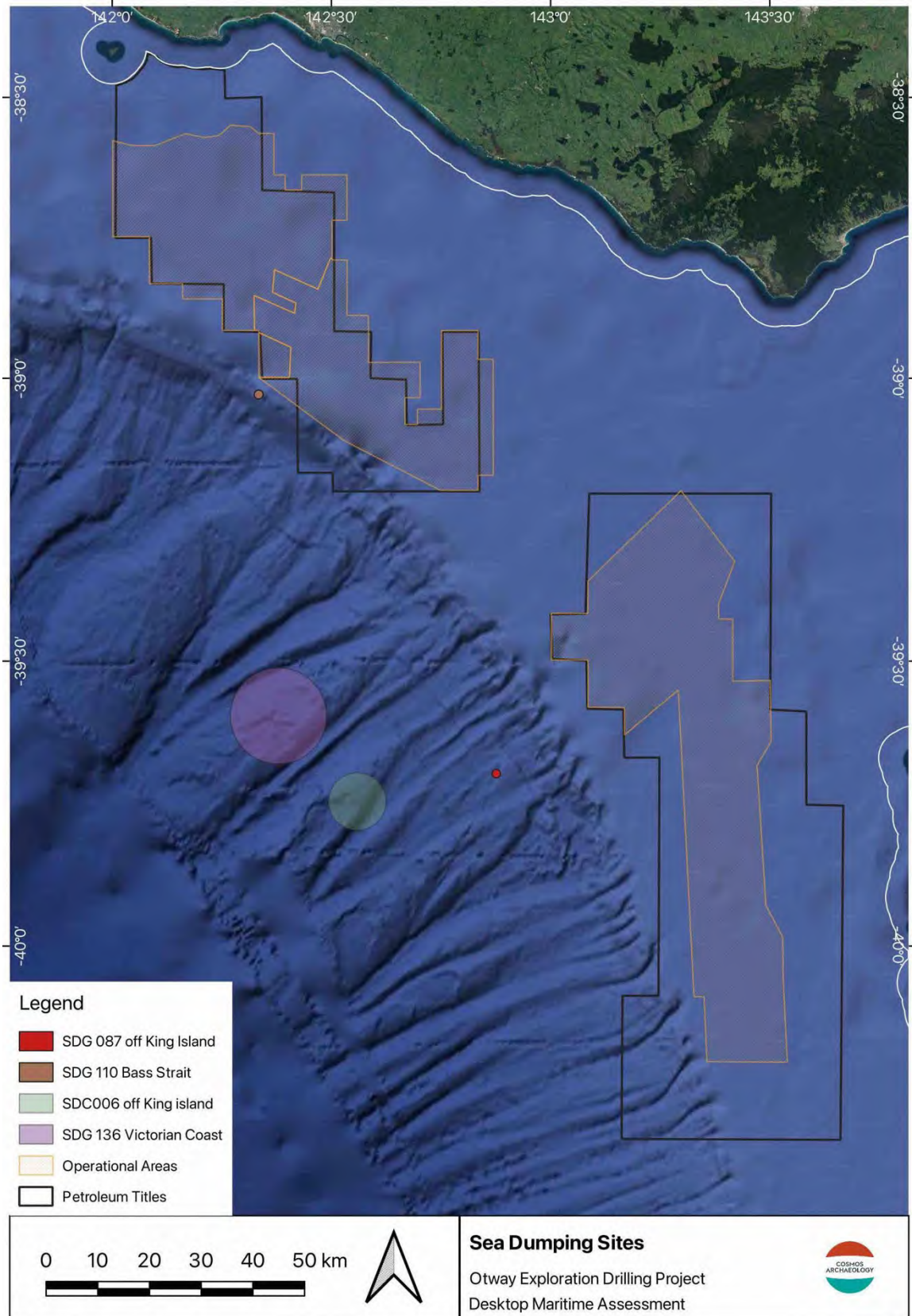


Figure 9: Sea Dumping sites within the vicinity of the study areas. (Base image: Google Satellite).

4.2.4 Firing Range

The search of Commonwealth's Department of Defence mapping application (uxo-map.defence.gov.au/) revealed that most of the operation area for T/49P and the southern edge of VIC P/79 overlaps with an identified Air to Air firing range used in 1954, designated 1052 King Island (Figure 10). No Defence reports are available for this site. This area has been categorised as having a slight potential to contain UXO.³⁷

³⁷ **Department of Defence, 2023** *Defence UXO Mapping Application*, available at <https://uxo.defence.gov.au/>.

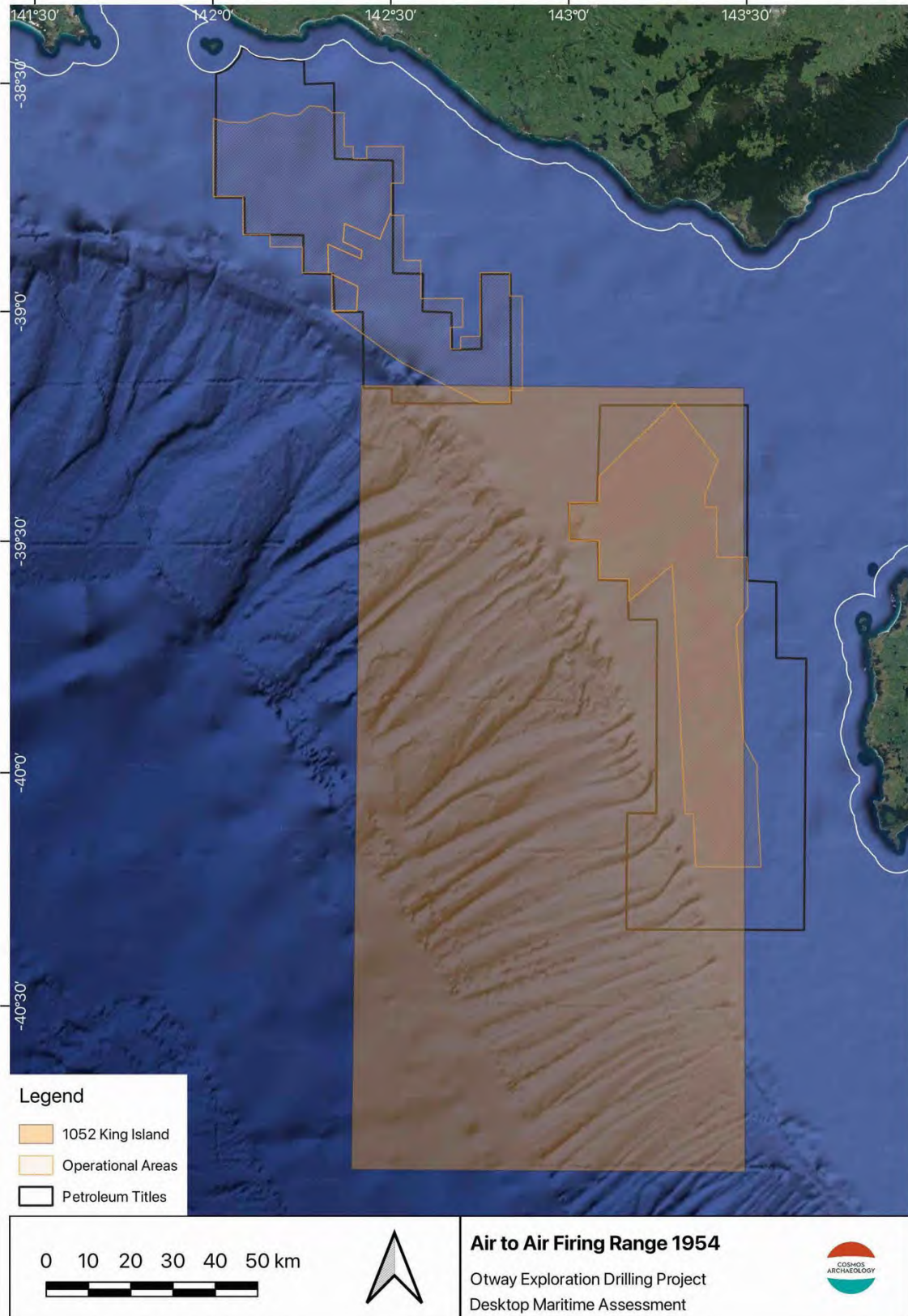


Figure 10: Designated Air to Air firing range in use in 1954; 1052 King Island.

4.3 Potential Maritime Archaeological Sites in the Study Area

4.3.1 Shipwrecks

Numerous ships are known to have wrecked in the waters off the coast of Victoria, off the coast of King Island and in Bass Strait. Many of these wrecks are known only from the historical record and have not been located. Additionally, there are numerous ships that were 'lost at sea' on routes that may or may not have been in the vicinity of the study area. The location of many of these wrecks is impossible to estimate, given the historical sources available, or the lack of any information on their disappearance.

An initial review of the UCHD and the VHD databases was undertaken for lost vessels using the search terms: Bass Strait, Cape Otway, Portland, Port Fairy, Warrnambool, Apollo Bay and King Island. This resulted in a list of 134 vessels. This list was further refined by using the following parameters to remove potential shipwrecks that were:

- found or located, and
- noted as being washed ashore, wrecked on a beach, inside a bay or inshore reef.

This refinement reduced the number of potential vessels to 12 shipwrecks with possible wrecking locations in the study area (Figure 11). The table below outlines those wrecks that appear either in the historical record or in the relevant databases (Table 3).

It must be noted that these vessels all have coordinates in the AUCHD that are presented as specific points for the position of shipwrecks that have not yet been found. If, for example, a ship was lost on a voyage from Portland to Melbourne and was last seen near Cape Otway, it will have been given an arbitrarily designated position expressed as a single latitude and longitude. This is not necessarily an indication of the vessel's actual wreck site.

Apart from reported shipwreck events which may have resulted in the formation of archaeological sites within the study area, a further unknown number of shipwrecks can be expected to have occurred within the study area. These could be vessels not accounted for in the local historical sources; vessels not listed on the insurance registers; small coastal craft, etcetera. Any such potential sites formed more than 75 years ago would be automatically protected under State and Commonwealth legislation.

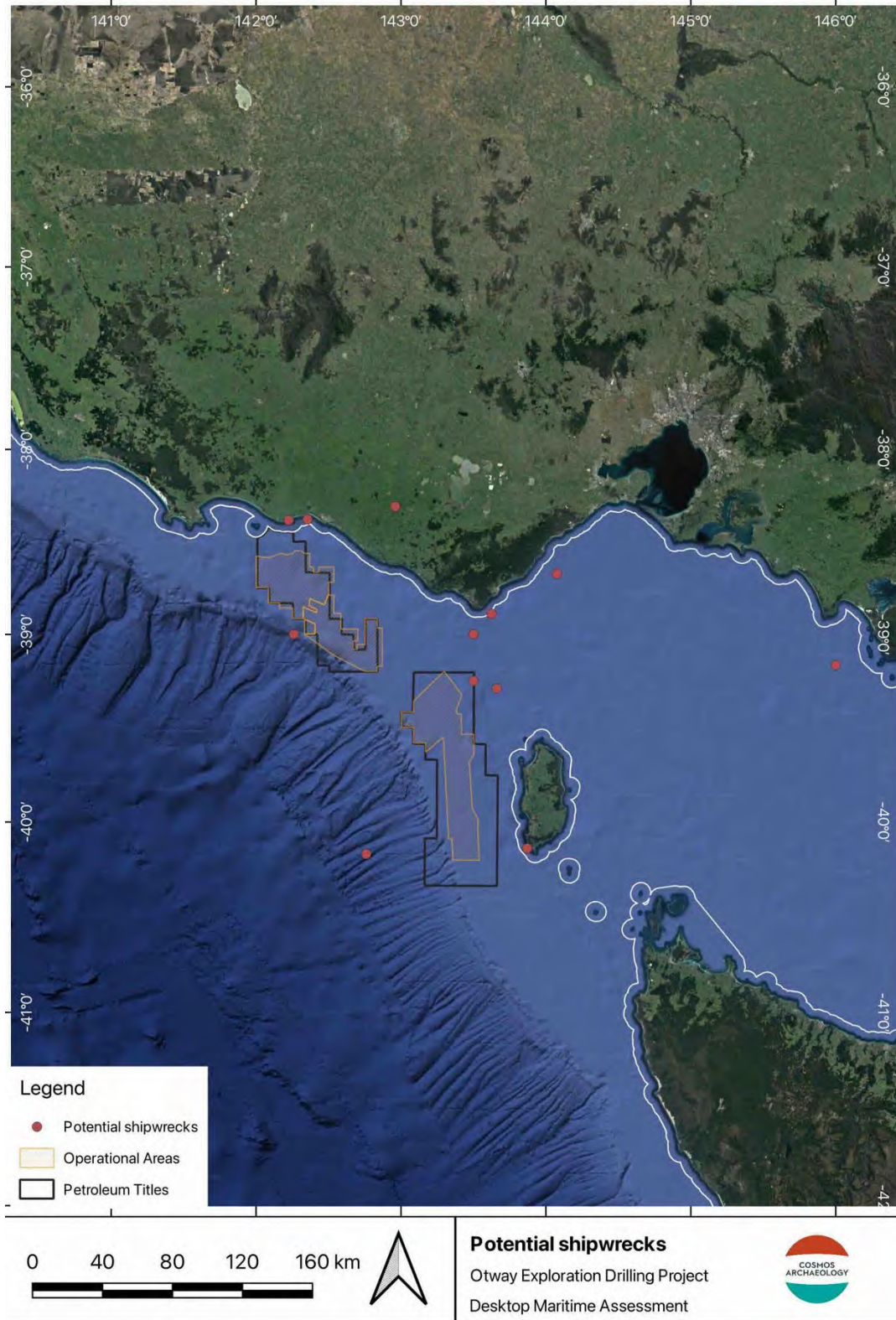


Figure 11: Potential shipwreck locations, as recorded in the AUCHD, that may be located within the study area. Note these positions are not necessarily the specific locations for the wreck site.

Table 3: List of unlocated shipwrecks that may have wrecked within the study area.

Source	Shipwreck ID UCHD / VHD	Name	Year built/where	Wrecked	Hull	Engine	Length (ft)	Tonnage	Details	UCHD Coordinates
UCHD / VHD	5998 / S70	Bat	1865 / UK	1882	Iron	sail	33.41	194	The 194-ton iron brig Bat went missing with all hands, after clearing out from Port Fairy on 30 March 1882 for a voyage to Sydney with a cargo of potatoes, bran and barley	-39.165, 146.00
UCHD / VHD	6011 / S62	Bitter Beer	UNK / AUS	1866	Wood	sail	UNK	UNK	The schooner Bitter Beer disappeared off Cape Otway in March 1866 during a heavy gale while sailing from Melbourne to Belfast (Port Fairy).	-38.38, 142.35
UCHD / VHD	6015 / S78	Black Watch	1866 / NZ	1867	Wood	sail	81.00	93	While on a voyage from Adelaide to New Zealand, the New Zealand built schooner Black Watch was abandoned after springing a leak off Cape Otway.	-39.00, 143.50
UCHD	7176	Freak	1823 / INDIA	1834	Wood	sail	64.7	103	Freak arrived from Mauritius in 1834 and was sailing to Sydney when it disappeared.	-40.17, 142.76
UCHD / VHD	6381 / S432	Madagascar	1837 / UK	1853	Wood	sail	UNK	952	Lost while voyaging from Melbourne to England with a huge cargo of gold and silver.	-38.31, 142.96
UCHD / VHD	6434 / S469	Minerva	1847 / AUS	1849	Wood	sail	60.20	UNK	Lost while transporting a cargo of gunpowder from Sydney to Portland.	-39.29, 143.66
UCHD / VHD	6486 / S517	Paul Jones	1877 / US	1886	Wood	sail	195.2	1206	Caught fire off Lorne on a voyage from Melbourne to Calcutta.	-38.67, 144.075
UCHD	7732	Southern Cross	1891 / UK	1920	Wood	sail	131	291	Travelling from Melbourne to Hobart with a cargo of benzine and disappeared. Some wreckage was found on the southwest of King Island and it is possible the vessel may have blown up or collided with a German mine.	-40.14, 143.87
UCHD / VHD	6576 / S110	SS Champion	1854 / UK	1857	Iron	Steam screw	129.4		Travelling from Portland to Melbourne, collided with the <i>Lady Bird</i> and sank within 15 minutes. One of Victoria's worst shipwreck disasters.	-38.89, 143.625
UCHD / VHD	6659 / S672	Thomas	1839 / AUS	1843	UNK	UNK	31.3	UNK	Travelling from Melbourne to Port Fairy (Belfast)	-38.385, 142.225
UCHD / VHD	11032 / S655	Tubal Cain	1857 / UK	1862	Iron framed	sail	UNK	787	Collided with the CONSTANCE and sank immediately	-39.00, 142.256
UCHD / VHD	6784 / S730	W. Gordon	1866	1879	Wood	sail	118.4	398.0	Departed Cape Town heading to Adelaide, W. Gordon disappeared at sea.	-39.25, 143.5

4.3.2 *Aircraft wrecks*

The desktop research for this report did not find any information on potential aircraft wrecks lost within the study areas and none of the unlocated aircraft wrecks listed on the AUCHD are considered likely to be within the study area. These incidents would usually be clearly represented in the historical record and therefore there is low potential for this category of UCH to be present within the study area.

The closest recorded aircraft crash that has not been located is approximately 65 km to the west of the operational area of T/49P (Figure 12). In 1962, A USAF B-57 twin engine reconnaissance aircraft, crashed approximately 2.5 miles offshore between Airey's Inlet and Lorne. A fisherman reported the engines were cutting in and out as it flew overhead. A doctor is reported as having dived to the wreck site after the crash and reported the canopy was still intact indicating the airmen had not ejected.³⁸ The aircraft is not automatically protected under Australian legislation but due to the fact it has missing US military personnel onboard, the US Government would have an interest. However, this site is recorded as 65 km from the study area, and it is considered very unlikely this aircraft would have drifted into the study area.

³⁸ **Anon., 1962**, 'Two More U.S. Airmen Killed', *The Canberra Times (ACT:1926 - 1995)*, 17 October, p. 1. Available at <http://nla.gov.au/nla.news-article104297461>, viewed 27 November 2023.

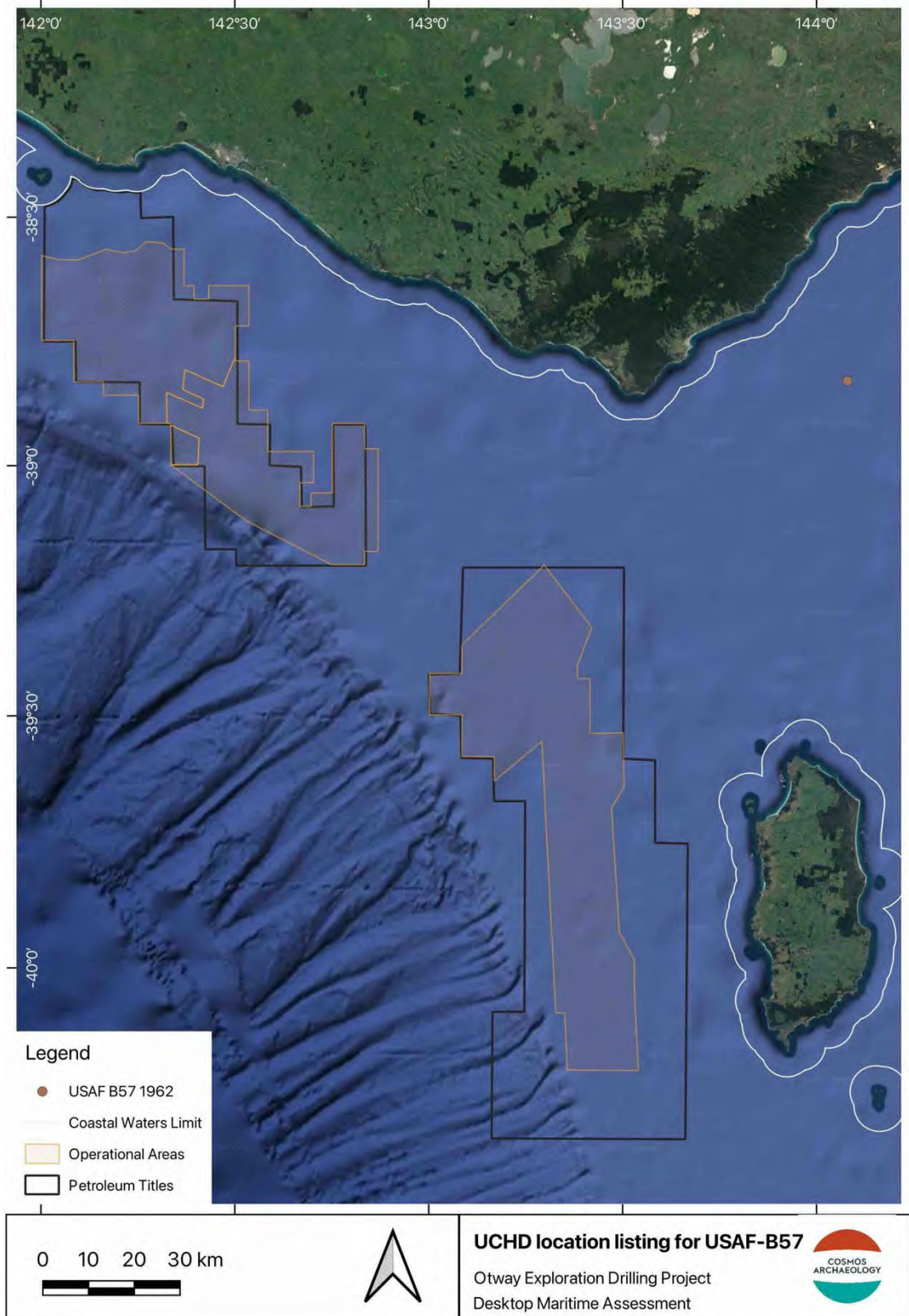


Figure 12: UChD location for USAF B57 crash site.

4.3.3 Sea dumping

There are no recorded, but unlocated, sea dumping sites within the study area. Note that the likelihood of unreported dumping is possible, and likely to increase in frequency in nearshore areas.

4.3.4 Other UCH

Other items of UCH could include historical anchors, jettisoned cannon and other items lost overboard or transported to their location from a nearby shipwreck site. The extensive use of the area and Bass Strait by shipping since colonial times, indicates there is potential for such items to be located within the study area.

4.4 Significance Criteria

Under the Commonwealth *Underwater Cultural Heritage Act 2018*, the Minister must have regard to the following criteria in making a declaration, under subsection 17(1), 18(1) or 19(1) of the Act, that an article is of heritage significance (see subsection 22(2)). The criteria provided by the Commonwealth are:

- The significance of the article in the course, evolution or pattern of history.
- The significance of the article in relation to its potential to yield information contributing to an understanding of history, technological accomplishments or social developments.
- The significance of the article in its potential to yield information about the composition and history of cultural remains and associated natural phenomena through examination of physical, chemical or biological processes.
- The significance of the article in representing or contributing to technical or creative accomplishments during a particular period.
- The significance of the article through its association with a community in contemporary Australia for social, cultural or spiritual reasons.
- The significance of the article for its potential to contribute to public education.
- The significance of the article in possessing rare, endangered or uncommon aspects of history.
- The significance of the article in demonstrating the characteristics of a class of cultural articles.

A significance assessment is an integral stage of a heritage impact assessment. As this desktop study has not identified any known sites within the study area, a significance assessment cannot be completed. Assessments of heritage significance will need to be undertaken as part of the heritage impact assessment process, after geophysical activities have been completed and any items of potential maritime heritage have been identified within the study area.

5 PREDICTED CONDITION OF MARITIME ARCHAEOLOGICAL SITES

5.1 Introduction

The condition of any maritime archaeological resource is affected by environmental and cultural factors as well as the nature of the seabed.

With regards to the study area, the following factors will have the greatest impact on site formation processes:

- Type of event leading to presence on seabed.
- Type of seabed.
- Mechanical damage caused by waves.
- Salvage.
- Anchor and trawl drags.
- Chemical and biological degradation.

5.2 Site Environment

The predicted condition for sites in the following sections includes both sandy and rocky seabed conditions to address the most likely scenarios.

5.3 Shipwrecks

The wrecking event is the first factor that influences site formation. Depending on the reasons or forces behind wrecking, the ship may be mostly complete or extensively broken up. A vessel rarely falls or sinks because of little or no damage; it is more likely that a vessel would run aground, cause damage to the hull, and then sink with part of the vessel intact and part damaged. Often the force of initial impact is sufficient to break the vessel and cause considerable damage. The vessel would then sink in large pieces, depending on the damage, or remain stuck until it is broken up by physical or human forces. Another reason for a wrecking event is fire which, depending on the extent, can cause a considerable amount of breaking up and scrambling of the ship material before it reaches the seabed.

It is reasonable to assume that a large majority of potential shipwrecks within the study area foundered. In this scenario, the vessel's structural remains would remain highly intact.

The seabed upon which a shipwreck lies has the greatest effect on site formation processes, particularly with wooden hulled vessels, while other factors also having contributory effects.

With regards to vessels coming to rest on a sandy seabed, the archaeological site will usually be formed in the following manner:

- Vessel comes to rest on the seabed.
- The wreck will settle into the seabed up to a certain depth, dependent on the resistance of the sediments and the weight of the vessel. It is a general rule, especially with iron hulled vessels, that wrecks sink into softer sediments up to their waterline.
- Parts of the vessel which protrude above the water may be salvaged for re-use. Non-perishable, accessible and high value parts of the vessel situated underwater may also be removed. It is a general rule that the deeper the water in which a vessel sinks and the more remote the location, the less

likelihood of it being salvaged at the time of loss. Rapidly changing technology in recent times, however, has allowed salvage at greater depths.

- Biological processes will commence immediately on a timber wreck, attacking the exposed timbers and other organic elements of the wreck. This will lead to a weakening of the hull's integrity and eventually organic elements above the seabed will disappear.
- If it is in shallow water, wind generated waves would act upon the broader surfaces of a wreck thereby breaking down exposed components into sections. These sections will orientate themselves to provide the least resistance to the direction from which the waves are more commonly generated.
- Large waves will raise sediments into suspension, thereby resulting in cultural objects, including the hull of the wreck, sinking further into the marine sediments. The older the wreck the deeper it would be buried, unless a hard-alluvial substrate is present close to the surface of the seabed against which the wreck will rest.
- Cultural behaviour will have the effect of scrambling wreck sites and masking their presence. Dragging anchors, scallop dredgers and trawling will spread wreck material and may also result in the 'ploughing up' of buried cultural material.
- Salvaging will have a destructive effect on the hull and organic elements that have survived below the seabed, as well as by removing artefacts and creating a scatter of remaining material around the wreck site.

A wreck coming to rest on a rocky bottom would eventually collapse under its own weight as it would not be able to sink into the seabed. With such a collapse the integrity or coherence of the wreck begins to dissipate. Pockets of surviving structure and other artefacts can remain well preserved amongst boulders, gullies and depressions.

Assessing the condition or, more precisely, the structural integrity of the shipwrecks is of relevance because this can provide an indication of the nature and scale of the obstacle that could affect exploration drilling activities. Shipwreck condition also relates to its 'detectability'. Several factors influence the condition of shipwrecks, the primary ones being the materials used in the construction of the vessel, the bottom type upon which the wreck rests, the depth of the wreck and its age.

With regards to detecting wreck sites, the two most common remote sensing techniques that are applied would be magnetometer and side scan sonar surveys. The side scan sonar would be more useful in detecting high- and low-profile wreck sites while the magnetometer is best employed in searching for sites with a high ferrous content which are partially buried or resting on a rocky bottom.

The 'younger' the wreck is, and the deeper it sank in the water column, the better preserved it would be. Also, a wreck resting on a sandy bottom would be better preserved than if it was resting on a rocky bottom. In conjunction with these factors, the method and type of construction of the vessel is the most important variable when it comes to assessing the condition of a wreck.

Iron/Steel Hulled Wrecks

If resting on a sandy bottom it could be expected that the hull integrity of the wreck would be relatively intact. The hull along midships may have collapsed but the stern and bow sections may still be upright or heeled to one side. The engine components, if any, would be largely intact and *in situ*. Such vessels on a rocky bottom would be relatively disarticulated, though

the components of the vessel would still be present. Iron/steel wrecks on either bottom type can be detected using a magnetometer. Locating such a wreck site on a rocky bottom with side scan sonar would be difficult but the opposite is true with such wrecks on a sandy seabed.

Wooden Hulled Wrecks with Engines

In most cases the hulls of such wrecks would have disappeared. In situations, however, where the wreck rests on a sandy bottom, sections of the hull may have been preserved under the sand. The engine components of such wrecks would be visible. A magnetometer can detect such wrecks on either bottom type. Such wrecks on a rocky bottom would be difficult to detect with side scan sonar but the opposite can be true with such wrecks on a sandy seabed. However, engine components can be partially or completely covered by sediments and would appear as scattered dumped debris or a linear mound.

Large Tonnage (> 100 ton) Wooden Hulled Wrecks (Sail)

In most cases the hulls of such wrecks would have disappeared. In situations, however, where the wreck rests on a sandy bottom, significant sections of the hull may have been preserved under the sand. There would be enough ferrous material present, such as anchors, chain and winches, for such wreck sites to be detected using a magnetometer. The identification of such wreck sites using side scan sonar would be difficult as it could appear as scattered dumped debris, unless the cargo was non-perishable, in which case a linear mound may be visible.

Small Tonnage (< 100 ton) Wooden Hulled Wrecks (Sail)

The same as for large tonnage vessels except that the size of the target and the amount of ferrous material present would be considerably less. It would be difficult to detect using a magnetometer and may be mistaken for dumped material debris from side scan sonar imaging.

5.4 Aircraft Wrecks

While the potential for aircraft wrecks is considered low, this discussion on site formation processes of aircraft wrecks is included in the case of an unexpected find.

There are significant differences between the site formation of underwater aircraft wrecks and shipwrecks due to the vastly different construction, in terms of both shape and material used, as well as the depositional process, i.e., the wrecking event. These are two key determining factors that will influence site formation.³⁹ The wrecking event for aircraft is the first factor affecting site formation, and can take many forms, from deliberate scuttling on the water's surface and dumping of material to high impact crashes and slower, more controlled ditching events. Aircraft dumping was considered 'fairly commonplace' following WWII, and significant dump sites exist near Sydney and Greencape in NSW, along with sites near Brisbane in QLD, and Rottneest Island in WA.⁴⁰ Aircraft wrecked because of military combat may have sustained significant damage before crashing into the water. Aircraft sitting on the surface of the water may have also been attacked and sunk through military action.⁴¹ The

³⁹ **Burgess, A., 2013**, Underwater Aviation Archaeology: What is its Place and Value Within Archaeology, and in Particular Maritime Archaeology?, Masters thesis, Faculty of Humanities, University of Southampton, United Kingdom.

⁴⁰ **Smith, T., 2004**, Plane Sailing: The archaeology of aircraft losses over water in NSW, Australia. Bulletin of the Australasian Institute for Maritime Archaeology. Vol. 28:113-124.

⁴¹ **Wilkinson, D., 2012**, Underwater aircraft sites in Australia: a summary of what has been learnt so far. Bulletin of the Australasian Institute for Maritime Archaeology. Vol. 36:31-35.

initial integrity of the aircraft hull depends largely on the wrecking incident, and is influenced by numerous factors, such as the speed and angle of impact upon entry.

Upon entering the water, the shape of the aircraft and the depth of the water column will determine how the aircraft comes to rest on the seafloor. Aircraft hulls and wings are typically made of lightweight material, such as aluminium or even wood and fabric, while machinery and components such as engines will weigh significantly more and contain more ferrous elements. This disparity in weight will cause some aircraft to invert on descent, coming to a rest on their back. Other aircraft, such as single engine WWII fighter planes built with engines at the front, will sink to the bottom nose first. As the aircraft sinks in the water column, it may break up further, with the loss of wings or tail sections being sometimes noted.⁴² Once on the seafloor, the combination of increased weight and galvanic corrosion due to differing metals means that larger components, such as engines, may detach and fall away from the rest of the structure. The depth of the wreck has a significant role in its deterioration, as aircraft sunk in shallower waters are more at risk from wave surge and corrosion due to warmer water temperature and increased oxygen levels.⁴³

The seafloor composition will determine the burial environment for a sunken aircraft which in turn will have a large impact on the survival and condition of the aircraft. Aircraft are generally lighter than ships and are therefore less likely to penetrate the seabed, and less of the hull may be buried. As with shipwrecks, it is assumed that aircraft that are quickly buried in an anaerobic, stable environment, deep underwater will be better preserved than those in shallow inshore environments, particularly those with hard seabed and heavy surf.⁴⁴

The composition of alloys used in aircraft construction can have a significant impact on the rate of deterioration once an aircraft has sunk. Aluminium, the primary material used in aircraft construction, is highly reactive. When alloyed with metals like copper, its corrosion rate is accelerated. This leads to a phenomenon known as 'pitting,' where perforations appear as the aluminium corrodes.⁴⁵ Water with a higher acidity will cause more rapid deterioration.

Although the site formation processes for sunken aircraft display large variation between sites, a general flow of deposition can be summarized:

- An aircraft enters the water, either through a violent and high-impact uncontrolled crash, slower deliberate bailout, or through dumping/scuttling on the surface. Aircraft may have sustained damage prior to entering water, such as those suffering mid-air explosions and aircraft shot down in combat.
- As the aircraft sinks, its orientation and hull integrity will change depending on its construction. Wings and tail may separate, and heavier components may invert an aircraft.
- The aircraft will settle on the sea bottom. Aircraft deposited on hard substrate may not be buried, while those settling on sandy, muddy, or silty bottoms may partially sink into the seafloor.
- In certain cases, salvaging operations may take place immediately, including the removal of high value components. In other cases, illicit salvaging, looting, treasure hunting, and souvenir taking can damage wrecks.
- Aircraft materials will begin to deteriorate over time, due to corrosion as well as natural and cultural external factors.

⁴² **Wessex Archaeology, 2008, *Aircraft Crash Sites at Sea: A Scoping Study*, Prepared for English Heritage.**

⁴³ *Op. Cit.*, **Smith, 2004.**

⁴⁴ *Op. Cit.*, **Wessex Archaeology, 2008.**

⁴⁵ *Op. Cit.*, **Burgess, 2013.**

- Corrosion will cause deterioration of metals, particularly aluminium, and may cause heavier ferrous components to detach.
- Human activities such as dredging, fishing and recreational boating can further disperse sites by dragging fishing nets and anchors across sunken aircraft.

5.5 Sea dumping

The location of sea dumping of ammunition, boats, chemicals and other materials have been recorded and made available by the Australian Government Department of Defence and Australian Hydrographic Service. The location and amount of the material dumped is documented; however, the exact location of the dumped material may differ from that recorded due to the depth of water in which the material was dumped and/or accuracy of the location provided of the dump site.

Information is provided by the Australian Hydrographic Service, including links to spreadsheets which contain information of specific sites. The Department of Defence also has a publicly available searchable mapping application that lists known dumping sites. The sites are grouped into five main categories, including ammunition, boats, chemicals and other materials as well as dumping grounds. Each record includes information such as latitude and longitude, date of dumping and description of materials. In addition, information on sea dumping has been made public through Australian Notices to Mariners since 1982.

Due to the relatively recent dumping events (after World War II) and that the ammunition items largely consist of iron, it is likely that the ammunition is still largely intact. They would be large and sturdy in their construction, dumped in a complete state. This would mean that all dumping items would physically still be intact, and as such, would be easily identifiable on the seabed.

If the ammunition was formed in a mound, that is, they were discarded as the vessel was stationary, they may have good relief against the seabed, especially a rocky seabed, and may be detected in SSS data as a mound. It is more likely that the dumps are low lying and of low relief from being discarded from a moving vessel, in which case they may be identifiable as a scatter like a rocky seabed. Ammunition, drums and demolition materials on the seabed or only buried under shallow sediment would still be largely intact, making them easier to detect.

6 POSSIBLE IMPACTS AND MITIGATION MEASURES

As the exact locations of maritime heritage in relation to the study area and the extent and detail of the works is still to be determined, the impacts presented here are of a general nature until further assessments including geophysical surveys have been completed.

This desktop assessment has found there is potential for maritime cultural heritage sites to be within the study area. As a result, there is potential for these sites to be impacted because of the works.

Cultural heritage sites can be damaged because of direct and indirect impacts by a variety of processes. Damage is categorised as mechanical, chemical or biological:

- *Mechanical damage* is where the physical integrity of the site is affected by the impacts of wave, surge, current, sand abrasion as well as cultural behaviour such as dredging, dragging anchors or vessels running aground. Increases in mechanical damage to a site can result from increases in tidal flows and increased exposure of sites to sediment erosion.
- *Chemical damage* relates primarily to the corrosion of the metal components of a site. Changes in pH levels, salinity, light levels (heat) and water movement can dramatically increase electrochemical (corrosion) activity for metal component immersed in seawater.
- *Biological damage* occurs where organic materials, such as wreck or wharf timbers, are exposed to biological organisms such as marine borers and bacteria, and in some cases vegetation. In relation to marine heritage sites, increased biological damage will occur if hitherto buried sites, or partially exposed sites, are further exposed, due to sediment erosion.

If a marine heritage site suffers from one or more of the above categories of damage it will become further 'scrambled'. The term 'scrambled' refers to alterations made to a site that make it more difficult to interpret/understand – that is, it results in the loss of information whether it be the loss/deterioration of physical fabric or loss of context (the relationship between artefacts). The term 'transformation' is used to describe alteration of material (such as breaking/pulverising, corrosion or marine borer damage) and the term 'translation' is used to describe the displacement (removal and/or dispersal) of material.⁴⁶

The scrambling of a marine heritage site reduces its overall cultural heritage significance. The degree of the reduction of cultural significance for a particular heritage site is related to the scale and extent of damage.

As the works details have not been refined at the time of writing, some general potential impacts are outlined below.

6.1 Potential Direct and Indirect Impacts

6.1.1 Direct Impacts

Direct impacts include mechanical contact with a maritime heritage item or site during the installation or removal of infrastructure. Direct impacts can also include the placement of anchor points, anchors dropped by barges and work vessels, anchor chains dragging across the seabed or other items laying across maritime heritage items. Such events have the potential to crush, damage and scramble components of maritime heritage. Scraping the

⁴⁶ Ward, I., P. Larcombe and P. Veth 1999 "A New Process-based Model for site formation" *Journal of Archaeological Science* Volume 26 p.561.

concretion off an item can remove protective accretions of marine concretion. In the case of ferrous items, this exposes the metal to salt and oxidation occurs, which rapidly increases the rate of corrosion resulting in the loss of strength and integrity of the metal. Exposure of organic items can expose them to marine life such as teredo and other marine worms that will directly damage the fabric of the item and weaken the structure.

Dredging or removal of the seabed may result in discrete items of shipborne debris going unnoticed and being lost within the volume of dredged material. This can cause direct damage to the fabric of the site but also disturb relationships (contexts) between structures, artefacts and their surroundings.

6.1.2 Indirect Impacts

Indirect impacts includes scouring. Scouring can occur from both the addition and subtraction of an item on the seabed. These actions can change the water flow and currents around maritime heritage sites and alter the levels of sediments. In some cases, this can be a positive result with accretion generally protecting a site from marine borers, disturbance or removal or rapid chemical change. However, scouring can reduce the sediments around and over maritime heritage and expose them to new and/or increased levels of decay. If scouring exposes part, or all, of an item of maritime heritage that has previously been protected by an anaerobic layer of sediment, it provides access to the item for marine borers and increases the oxygen and salinity. It can also expose the item to strong currents placing more pressure on weakened structures.

6.2 Potential Mitigation

Mitigation measures aim to ensure that maritime heritage within the study area would not be materially affected.

6.2.1 Further investigation

A geophysical survey should be undertaken that is designed to detect any items of maritime heritage within the general study area and specifically in the areas of potential direct impacts to the seabed. This would include side scan survey (SSS) and magnetometer surveys at a minimum. These surveys should be designed to ensure 100% coverage of the area of interest. The resolution for the side scan should be no greater than 1m. This detailed geophysical survey will provide a more complete picture of items of potential maritime heritage and allow for preparation of further management plans.

6.2.2 Statement of Heritage Impact (SoHI)

Direct physical or indirect impacts on all potential items of maritime heritage should be avoided, where possible. Once the detailed geophysical survey is complete a Statement of Heritage Impact (SoHI) should be undertaken.

- Review the geophysical data for items of maritime heritage.
- Build on the historical research from this desktop assessment.
- Assess the significance of any sites that are to be impacted or are within the project area.
- Further non-destructive investigation such as ROV inspections and/or archaeological diving surveys maybe required of identified anomalies that are within or close to areas of infrastructure implementation or seabed disturbance

that may potentially be archaeological items to confirm their identity, locations and significance.

- Propose mitigation measures based on the significance of the site/s. This could include changing design, archaeological recording, excavation and/or conservation.

7 CONCLUSION

7.1 Summary of findings

This desktop study has identified no known shipwrecks, aircraft wrecks or sea dumping sites within the study area. There is one potential shipwreck that may be in the vicinity of the study. *SS Seljie* has several coordinates listed for its location, the closest of which is 6 km from the study area.

The review of the heritage databases and historical sources identified 12 shipwrecks that could potentially be located within the study area. The accuracy of the information detailing their wrecking location, and the coordinates assigned to specific wrecks in heritage databases, varies from case to case. It is considered possible that any of these wrecks, or none of them, may be located within the study areas. Note that the frequency of shipwrecks increases with proximity to shore and decreases further offshore where navigational hazards are less.

A further unknown number of shipwrecks can be expected to have occurred within the study area. These could be vessels not accounted for in the local historical sources; vessels not listed on the insurance registers, or small coastal craft as examples.

Other items of maritime heritage including historical anchors, jettisoned cannon and other items lost overboard or transported to their location from a nearby shipwreck site could also be within the study area. The extensive use of the area and Bass Strait by shipping since colonial times, indicates there is potential for such items to be located within the study area.

If an item of maritime heritage is discovered, it is a legal requirement to notify the relevant state or Commonwealth heritage authorities with details of the find as soon as possible.

7.2 Notification procedure

A person who discovers a shipwreck, aircraft, or other cultural heritage in Commonwealth waters is legally obliged to notify the appropriate authorities as soon as practicable under Part 3 Section 40 of the *Underwater Cultural Heritage Act 2018*. The Department of Climate Change, Energy, the Environment, and Water (DCCEEW) must be notified if any unknown or un-located shipwreck or aircraft sites are identified through any of the works. This can be done through an online form for the 'Notification of discovery of underwater cultural heritage', available through:

<https://environment.gov.au/shipwreck/public/forms/notification.do?mode=add>.

Victoria and Tasmania each have a Commonwealth delegation to manage Commonwealth waters off their respective coastlines. When a notification of a discovery of an item of UCH is made through the AUCHD, it will go to the relevant state practitioner to evaluate.⁴⁷

In Victoria, the State Practitioner and Commonwealth delegate is:

The Principal, Maritime Archaeology
Heritage Victoria
Department of Transport and Planning

Tel: (03) 7022 6390

Email: heritage.victoria@delwp.vic.gov.au

⁴⁷ Pers. Comm. D. Wilkinson email with author (27 November 2023, 3:48 pm) Re: *Shipwreck Advice – Otway Drilling Project*.

In Tasmania, the State Practitioner and Commonwealth delegate is:

Section Head
Historic Heritage
Tasmania Parks and Wildlife Service

GPO Box 1751
Hobart Tas 7001
Tel: 1300 TASPARKS (1300 8277 27)

While the line of division between Victoria and Tasmania Commonwealth delegation is not clear, in consultation with the Victorian and Tasmanian practitioners, the notification procedure for the project will be as follows:⁴⁸

For VIC/P79 any finds should be recorded in the AUCHD for the Victorian Practitioner and Commonwealth delegate to evaluate. Any queries regarding potential items of UCH within the operation areas of VIC/P79 can be addressed to the Victorian Practitioner for assistance.

For T/49P any finds should be recorded in the AUCHD for the Tasmanian Practitioner and Commonwealth delegate to evaluate. Any queries regarding potential items of UCH within the operation areas of T/49P can be addressed to the Tasmanian Practitioner for assistance.

⁴⁸ *Pers. Comm.* D. Wilkinson email with author (27 November 2023, 3:48 pm) Re: Shipwreck Advice – Otway Drilling Project. **and** *Pers. Comm.* M. Nash email with author (4 December 2023, 7:14 am) *Notification procedure for UCH Commonwealth waters for Otway Basin Exploration Drilling.*

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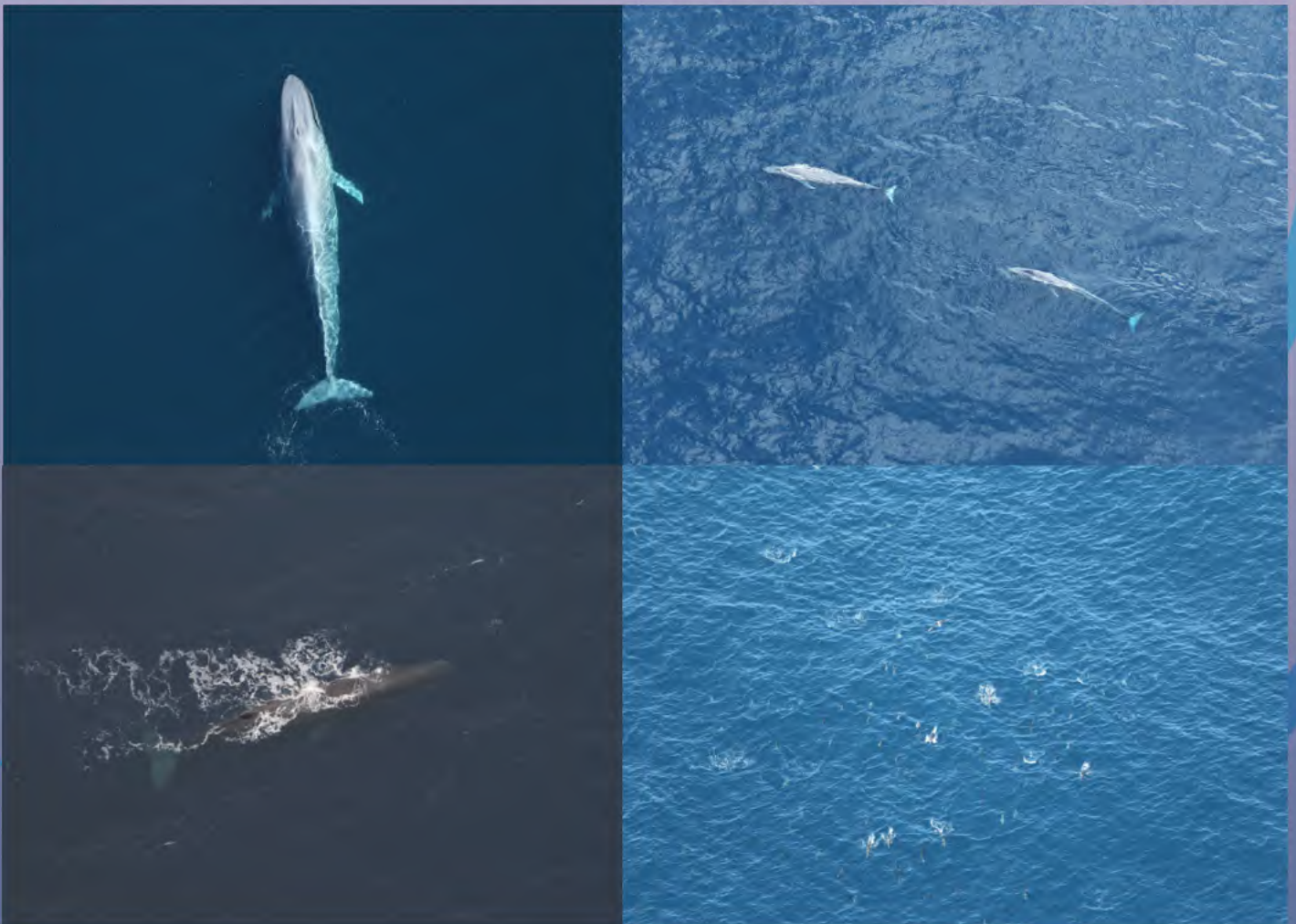
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APPENDIX P CETACEAN SURVEILLANCE PROGRAM

ConocoPhillips Australia

T/49P and VIC/P79 Cetacean Surveillance Program Report



Report to ConocoPhillips Australia SH1 Pty Ltd and
ConocoPhillips Australia SH2 Pty Ltd

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ConocoPhillips Australia Cetacean Surveillance Program Report

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Fathom Pacific acknowledges the Bunurong People, the Traditional Owners of where we reside. We acknowledge Aboriginal and Torres Strait Islander peoples as Australia's First Peoples, and we acknowledge the Traditional Owners of the customary lands, seas, skies and waterways in which we work, travel and meet.

Fathom Pacific acknowledges the designer of the Torres Strait Islander flag, the late Mr Bernard Namok.



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Executive Summary

ConocoPhillips Australia SH1 Pty Ltd and ConocoPhillips Australia SH2 Pty Ltd (ConocoPhillips Australia) are proposing to conduct petroleum exploration activities, involving seabed surveys (non-seismic) and drilling, within petroleum titles T/49P and VIC/P79 (permit areas) in the offshore Otway Basin, south of Victoria and west of King Island, Tasmania.

ConocoPhillips Australia contracted Fathom Pacific Pty Ltd (Fathom Pacific) to conduct aerial surveillance for marine mammals within the two petroleum titles, and along offshore continental slope waters, to inform impact assessment and mitigation considerations in the development of an Environment Plan (EP) for exploration activities.

This report covers the period from August 2022 to June 2023 and builds on previous aerial surveys conducted for ConocoPhillips Australia during the Sequoia 3D Marine Seismic Survey (MSS) between July and October 2021 in T/49P. The survey program is continuing beyond the initial term (August-April) into May and June 2023 due to the ongoing detection of blue whales.

The results of this study provide contemporary context on the temporal and spatial distribution of whales in the region. Twelve (12) cetacean species were conclusively identified during aerial surveys, with blue whales, humpback whales and sperm whales being the most commonly sighted species. Blue whales (presumed pygmy blues) were sighted between October and April. The October onset of blue whale occurrence is earlier than historical published data for this species in the region. [Noting that unpublished data from the ConocoPhillips Australia 2021 survey program detected blue whales as early as September in T/49P]. Blue whale numbers (40 individuals recorded in April) peaked later in the season than previously reported. Blue whales were frequently observed feeding and observations were typically associated with co-occurrence of large surface krill swarms throughout the study area. Observations of blue whales in the vicinity of King Island and extending east into Bass Strait have provided new information on the distribution of this species in the broader region.

Observations of migratory humpback whales support an emerging understanding that a migratory pathway exists through central and western Bass Strait that may connect with the eastern Australian migratory corridor. The majority of humpback whale observations were associated with feeding behaviour and commonly involved multi-species assemblages of dolphins, fur seals and seabirds.

Sperm whales were regularly sighted in the present study. Considering the low survey effort that targeted known sperm whale habitat (offshore continental slope waters), this suggests frequent habitat use by sperm whales. There have been no dedicated sperm whale surveys in the region, but our anecdotal observations suggest that sperm whale numbers in the present study were higher than other surveys off eastern Victoria which sample known sperm whale habitat.

There was no consistent spatial pattern in the distribution of whales within the petroleum titles. Within VIC/P79, blue whales occurred throughout offshore and inshore segments and spanned east to west. Feeding was observed throughout the area. In T/49P, blue whales were observed

along transects and further northwest and northeast into Bass Strait (beyond T/49P). Temporal overlap in the presence of humpback whales and blue whales was detected in VIC/P79 in the months of November–December.

Whales in general, and blue whales in particular, have high energy demands that must be met by feeding, with their distributions closely tied to the distribution of prey. For baleen whales, prey in this region is predominantly krill. Furthermore, the distribution of krill is closely linked to spatial and temporal patterns in primary production by phytoplankton, which in turn is closely linked to the supply of nutrients and oceanographic processes. The oceanographic environment of VIC/P79 is likely to be primarily influenced by the Leeuwin and Zeehan Currents and upwelling processes associated with the Great Southern Australian Coastal Upwelling System (GSACUS) which is documented to generate enhanced productivity and provide foraging grounds for blue whales. While these same processes may play a role in T/49P, other complex associations with the Flinders Current, the Subtropical Convergence and localised productivity enhancements (possibly amplified by topographic interactions with the West Tasmania Canyons Key Ecological Feature (KEF)) are expected to impinge on the area.

The present study indicates that the notion of whale ‘seasons’ must be viewed with caution for species other than perhaps humpback whales that generally have more predictable migratory movements. In light of the various synergistic influences of complex oceanography on the prey field which can attract wide-ranging and constantly feeding species such as blue whales and given ecological shifts that may be related to climate change, there is a need to focus not only on temporal staging of activities but also on adaptive management and mitigation measures to minimise risk of impact to cetaceans across all seasons. A multiple-lines-of-evidence surveillance approach, linked to a responsive, best practice adaptive management framework is recommended.

1. Introduction

1.1. Background

Acoustic impacts to cetaceans are a key consideration for the permitting of oil-and-gas exploration and operational activities. The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) regulates the industry and permitting is managed via NOPSEMA’s acceptance of a proponent’s Environment Plan (EP).

Fathom Pacific was initially contracted by ConocoPhillips Australia to complete a study of the distribution and abundance of cetaceans within petroleum title VIC/P79 in the western area of the Otway Basin. The study was later expanded to include the continental shelf break southeast of VIC/P79 and one pre-existing transect line at the eastern boundary of petroleum title T/49P (Figure 1-1). Aerial surveys spanned from August 2022 to June 2023.

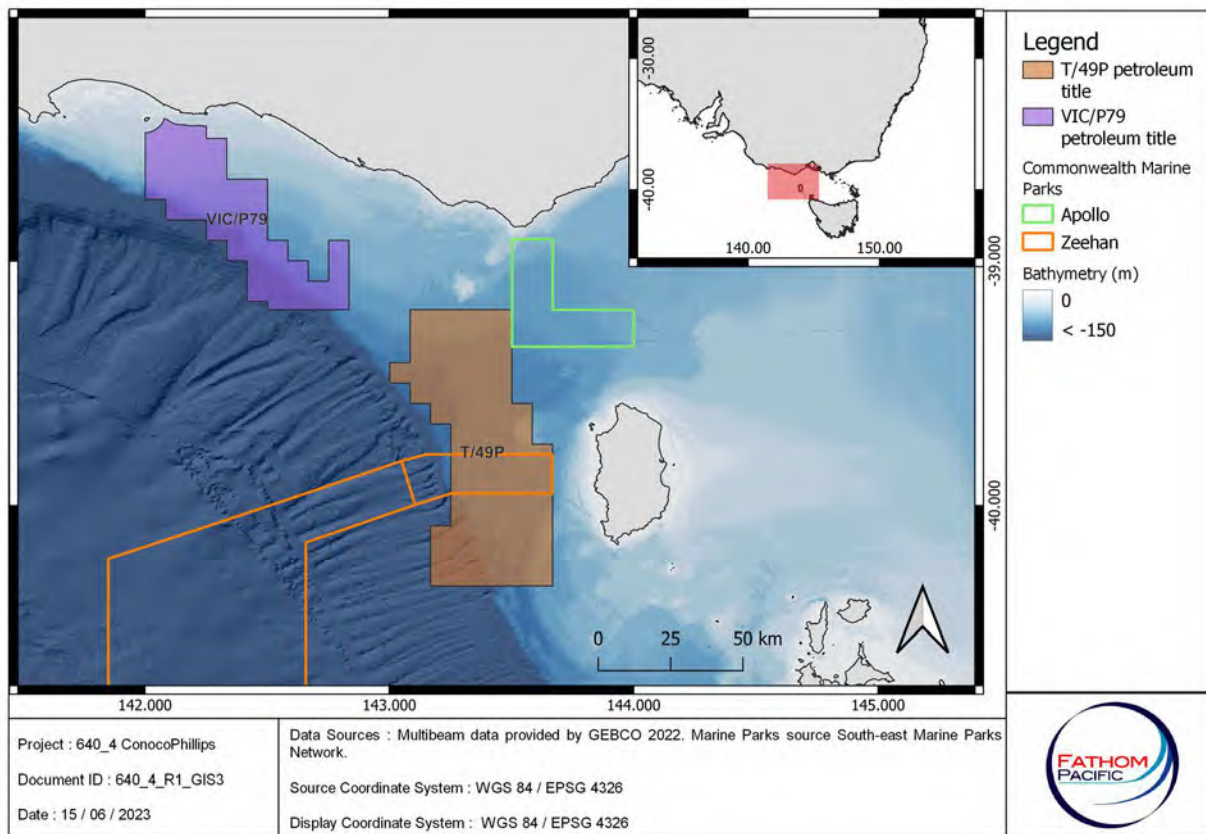


Figure 1-1 Study area.

The Otway Basin is an onshore and offshore basin located in south-eastern Australia. It extends 500 km from Cape Jaffa in South Australia to the north-west of Tasmania, spanning an area approximately 155,000 km² (Geoscience Australia, 2019). The offshore Otway Basin includes ecophysical habitats of the continental shelf, continental shelf break, continental slope and extends into deep oceanic waters. The eastern boundary of the basin extends past Cape Otway in Victoria and runs parallel to the west of King Island (Geoscience Australia, 2019).

The Otway Basin lies beneath part of the South-east Marine Region, an area which incorporates Commonwealth waters of western Bass Strait. Western Bass Strait is influenced by complex oceanographic processes involving an extensive upwelling system and interaction between

several currents including the Leeuwin, Antarctic Circumpolar, the East Australian, Flinders and Zeehan currents (Ridgway, 2007; Ridgway and Condie, 2004; Rogers et al., 2013). These processes can contribute to areas of increased productivity in the region and provide conditions for high biodiversity (Commonwealth of Australia (CoA), 2015; Rogers et al., 2013). Oceanographic processes are discussed further in Section 3.5.

In western Victoria, the region is divided further into provincial bioregions - the Western Bass Strait Shelf Transition for inshore waters and the West Tasmania Transition for offshore waters (CoA, 2015). Key Ecological Features (KEFs) in these regions include the Great Southern Australian Coastal Upwelling System (GSACUS) and the West Tasmania Canyons. The GSACUS is a predictable seasonal upwelling which supports high productivity in the region by transporting nutrient rich, cold water to the sea surface. It forms part of a regional system of upwellings, but it is the most prominent and is a recognised blue whale foraging area (CoA, 2015). The West Tasmania Canyons are situated on the continental shelf offshore from western Tasmania and extend northwards. Due to their influence on currents, ability to trap waters and produce sediment and nutrient rich upwellings, they contribute significantly to productivity in the area which can result in biodiversity hotspots (CoA, 2015). The deep oceanic areas of the Otway Basin are also influenced by oceanographic features and processes of the Subtropical Convergence and associated eddies encroaching from the Great Australian Bight.

Gill (2002) conducted aerial surveys between 1998-2001 which focused on blue whales and aimed to measure seasonal presence/absence and distribution. The survey area extended from Robe, South Australia in the west to Port Campbell, Victoria to the east and covered the entire continental shelf between these locations, encompassing an estimated area of 12,000 km². Most of the aerial surveys were timed to align with the summer-autumn upwelling seasons, with a reduced effort during winter and spring. Consequently, surveys were not conducted at regular intervals across the year or seasons. A total of 354 blue whales were recorded on aerial surveys between December 1998 and April 2001, all of which were located on the continental shelf. Gill (2002) observed feeding behaviour in 36% of blue whale sightings and recorded 48% of sightings were in proximity to surface krill swarms. This led to the conclusion that a link between the GSACUS, presence of krill and blue whales exists and the probability the adjacent waters to the Bonney and Otway Coasts are important feeding grounds for blue whales. This region is the world's only northern boundary current ecosystem (the Flinders Current) and Ward et al. (2006) also identified the importance of upwelling processes to the production and distribution of small pelagic fishes that are key to the diets of southern bluefin tuna. While the GSACUS is a key regional driver of production, Kämpf and Kavi (2017) identified widespread phytoplankton blooms throughout the region which is in support of a single extensive upwelling system, that could support predator populations.

Gill et al. (2011) completed 69 aerial surveys between January 2002 and May 2007 in which six upwelling seasons occurred. The survey area extended from the Great Australian Bight (west of the Eyre Peninsula) in South Australia to Cape Otway in Victoria and was divided into three zones: western, central, and eastern. Transects usually extended from <1 km off the coast to ~5 km offshore of the 200 m shelf break. The study used blue whale sightings from aerial surveys and a range of biophysical habitat variables to assess habitat selection, distribution, and relative abundance of blue whales. Findings from this study showed a trend in blue whale distribution in the western zone with presence commencing November to December. A south-eastward movement of blue whales to the central and eastern zones was

observed in January to April. Gill et al (2011) also suggested distribution of euphausiid prey, *Nyctiphanes australis*, is the key influencing factor of blue whale distribution. This was based on the similarities in the distribution of both species, observed blue whale feeding behaviour and knowledge of the species' ecology. The 2011 study also supported the Gill (2002) assessment that this area is an important foraging area for blue whales.

Mustoe (2002) conducted aerial surveys in Bass Strait for Esso Australia in 2001-2002. These surveys also focused on blue whales but primarily covered areas east of King Island in Bass Strait, however some transects west of King Island were completed. No blue whales were observed in the area west of King Island, however there were sightings between the south of King Island and the north-west of Tasmania.

Survey transects for the 2022-2023 ConocoPhillips Australia Cetacean Surveillance Program in VIC/P79 were selected to partially overlapped areas surveyed by Gill (2002) and the eastern zone surveyed by Gill et al (2011) extending from Cape Nelson to Cape Otway in western Bass Strait. The remaining transects in VIC/P79 were positioned in previously unsurveyed areas to provide data specific to the petroleum titles. Transect lines surveyed by Mustoe (2002) were limited on the west of King Island but likely intersected transects surveyed in T/49P, either in the 2021 or 2022-2023 surveys. The ConocoPhillips Australia 2022-2023 Cetacean Surveillance Program maintained consistent and regular effort for aerial surveys with two flights completed per month from August 2022 to June 2023, with the exception of one September flight missed due to unfavourable weather and one flight aborted due to unexpected low cloud (12 January 2023).

1.2. Objectives

The objectives of 2022-2023 Cetacean Surveillance Program were to:

- Provide aerial observation data on the occurrence of cetaceans in petroleum titles VIC/P79 and T/49P, with opportunistic observations elsewhere.
- Detect the timing of the onset, peak and downturn of blue whale occurrence within VIC/P79 and T/49P.
- Gather information on the presence of southern right whales (SRW) along the Victorian coast.
- Provide data that leverages historic records to contemporise the baseline of knowledge on spatial and temporal distributions of cetaceans in the region to support EP development, and to contribute to government data repositories and research.

2. Methods

2.1. Aerial survey transects

Aerial surveys focused on providing contemporary cetacean data for VIC/P79 and a section of T/49P. Connecting transects and transit legs allowed for additional observations and further regional context (Figure 2-1). Parallel transects were spaced at five-kilometre intervals over the survey area, standardised against current Victorian marine mammal aerial survey methodologies. A distance of 2.5 kilometres either side of the aircraft was identified as the limit for small cetacean detection which made each transect a five-kilometre-wide observation swath. A single survey was also conducted whereby an additional coastal transect was included to search for the presence and onset of migration of southern right whales during their calving season.

Transect lines were designed to overlap historical transects previously flown by the Blue Whale Study where possible. The purpose of this overlap was to add value to existing datasets through replication of historical methods.

Due to a marked increase in krill observations during the third aerial survey, an additional four transect lines were added to the survey plan (transects SB01, SB02, SB03 and T06 in T/49P). These transects were completed after refuelling on each survey day and transited north/south through VIC/P79 from Warrnambool to the continental shelf break then southeast along the shelf break to the southeast corner of T/49P, before turning north along the pre-existing transect T06 (Figure 2-1). This portion of the survey was added to gather data to inform on cetacean presence outside of the permit areas and to understand the influence of the shelf break area on the presence of surface krill across the continental shelf.

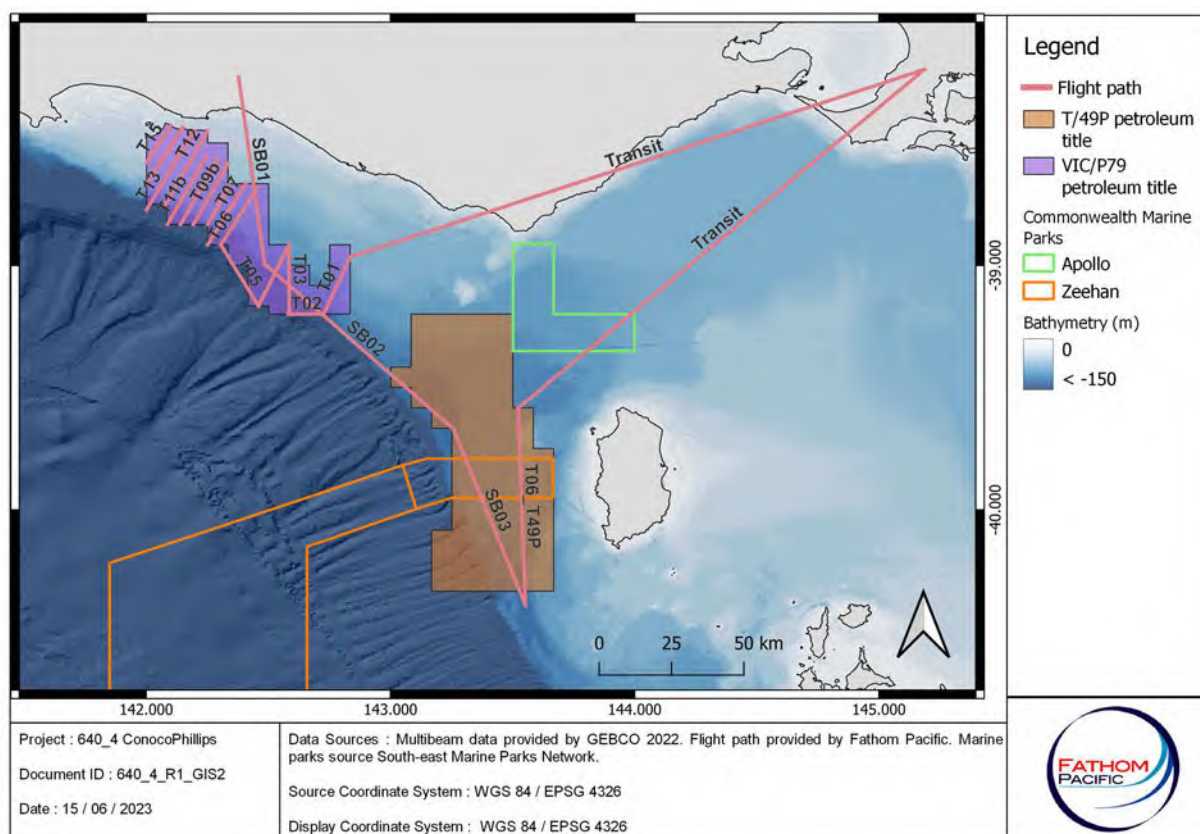


Figure 2-1 Flight plan showing transect lines, lease areas and Commonwealth Marine Parks.

2.1.1. Design considerations

The survey design focused on covering potential operational areas that may be affected by sound propagation associated with exploration activities. There was also consideration given to surveying outside of the petroleum titles to obtain a broader spatial understanding of regional trends. A maximum wind speed of 10 knots and a minimum cloud base of 800 metres were set as minimum requirements for surveys. Altitude was set at 300 metres over Commonwealth waters and 500 metres over Victorian state waters, air speed was 130 knots during transects. A maximum time limit of 10 minutes was imposed for orbiting over cetaceans to minimise disturbance and allow for detection of southern right whale calves (survey one) based on their known diving behaviour (Nielsen et al., 2019).

All surveys were flown after careful consideration of weather forecasts with a particular focus on wind speed and direction, cloud cover, cloud height and likelihood of precipitation.

2.1.2. Temporal coverage

Flights were flown from August to June, allowing the program to explore seasonal variations of key cetacean species, primarily blue whales, within the region. In this report results are presented according to flight date and season. A summary of the temporal coverage of the aerial surveys is presented in the table below (Table 2-1). A single June survey was flown and included here as part of the ‘Autumn’ survey period.

Table 2-1 Table summarising temporal coverage of all aerial surveys.

Flight date	Season
8/08/2022	Winter
26/08/2022	Winter
13/09/2022	Spring
2/10/2022	Spring
19/10/2022	Spring
4/11/2022	Spring
17/11/2022	Spring
2/12/2022	Summer
29/12/2022	Summer
24/01/2023	Summer
7/02/2023	Summer
16/02/2023	Summer
14/03/2023	Autumn
26/03/2023	Autumn
3/04/2023	Autumn
23/04/2023	Autumn
10/05/23	Autumn
2/06/2023	Autumn

2.1.3. Victorian waters

With the exception of the first survey, transits to and from the take-off and landing location (Tyabb) and to and from the refuelling location (Warrnambool), crossed Victorian waters (coast to three nautical miles seaward). During these transit periods an altitude of 500 metres was maintained, as per Victorian State Government (Marine Mammals) Wildlife Regulations 2019. Casual off-effort observation was maintained to collect opportunistic sightings of cetaceans during these transits. The exception to these observations was the inclusion of a single southern right whale (SRW) dedicated coastal survey. The SRW survey comprised of two segments: Point Lonsdale to Cape Otway (Segment One) and Port Fairy to Port Campbell (Segment Two). These efforts transited over the Victorian coast with observers looking out to sea. When a SRW was detected, the aircraft would break from the transect line to orbit the animal(s) for no longer than 10 minutes to acquire a GPS waypoint and obtain photo identification imagery. If a whale or whales displayed any signs of disturbance, orbiting was immediately aborted. No behavioural disturbances were observed during these efforts.

These SRW focused efforts were discontinued after survey one on 8 August 2022, following consultation with the Department of Energy, Environment and Climate Action (DEECA).

2.2. Observation program

2.2.1. Permits

Due to the need for the aerial survey program to cross Victorian State waters a DEECA permit was acquired in February of 2023. This permit allowed the survey aircraft to operate over Victorian State waters at a minimum altitude of 300 metres. The permit is held by Dr Adrian Flynn, reference number: 10010604.

In addition to the DEECA Victorian State waters permit, this program also operated under an Australian Marine Park Activity Permit issued by the Director of Marine Parks at Parks Australia and the Department of Climate Change, Energy, the Environment and Water (DCCEEW). This permit is held by Mr David Donnelly, reference number: 2021-00089-1. This permit allowed for the surveys to fly uninterrupted over the Apollo and Zeehan Marine Parks.

2.2.2. Aircraft

The aircraft used for each survey was a Cessna 337, registration VH-FSA or VH-LSZ (Figure 2-2). This make of aircraft was selected based on its wide use globally for similar projects, notably north Atlantic right whale surveys. These aircraft have remarkable in-air stability, twin engines, large windows, a high wing and an excellent safety record. Pilots used for these surveys had extensive experience in aerial cetacean surveillance.



Figure 2-2 Survey aircraft, Cessna 337 VH-FSA.

2.2.3. Observations

The aerial surveillance team was comprised of one lead observer and two experienced observers, one of which also performed the role of data recorder. The two most experienced observers were each equipped with a DSLR camera fitted with a 400 mm lens and were responsible for identifying species, photographing targets, estimating abundance, directing the pilot as required and narrating observations to the data recorder. For surveys conducted from 17 November 2022 onwards, observers used Suunto® clinometers to record the inclination angle of a sighting from the plane, allowing for reprojection of the target's position during post-processing of data. The data recorder used a Garmin Montana GPS to track the flight and record waypoints during sighting events and populated two field datasheets, one being for sighting records, the other to record transect and transit observing effort. The sightings datasheet (Appendix 1) included fields for species, sighting waypoints, number of individuals per sighting, behavioural state, sighting cue and direction of travel. The effort datasheet (Appendix 2) recorded timing of transects, observer details and environmental conditions per transect. When a cetacean detection was made, details from the event were collected using one of two modes depending on the type of event.

2.2.3.1. *Passing mode*

Passing mode was used if the target could be identified from the transect line. This mode required the observer to inform the data recorder of the event and to mark a waypoint when the target was perpendicular to the aircraft. At the same time, the observer measured the vertical angle to the target using a clinometer and provided the data recorder with the sighting details which included species, sighting cue, abundance, observed behaviour and direction of travel.

2.2.3.2. *Closing mode*

Closing mode was used when a large whale of unconfirmed species, a blue whale or a significant feeding event was observed. In these instances, the aircraft broke from the transect line to determine species and to record a waypoint near to the target. Once species was confirmed, photographed and abundance estimated, the aircraft returned to the transect line and continued the survey.

2.2.4. Taxa identification

Sighted fauna was identified to species level wherever possible. Species identification during aerial surveys can be challenging, particularly for small and/or cryptic species. In cases where the species identification was not immediately obvious in flight, orbiting of the animal(s) would commence and diagnostic details and photographs would be acquired. At the completion of a flight and after post-flight data and image back-up had been completed, imagery and observational details relating to unidentified cetaceans would be isolated and examined by in-house taxonomic specialists. This involved scrutinising of imagery and use of visible diagnostic features of animals for comparison to the literature in an attempt to reach a species level identification. If species identification remained unclear, a small image and data package was sent to external taxonomic specialists. This team of specialists comprised of three internationally recognised specialists who had familiarity with cetacean species likely to be present within the survey area(s). Feedback from this team often but not always resulted in identification to species level. Where a species level identification was not possible the animal

would be assigned a morphospecies identification accompanied by comments relating to probability of species.

2.2.5. Body Condition of Large Whales

Body condition scoring was focussed exclusively on blue whales and only remarked upon if observations of animals presented in poor condition. Scoring was based on observations made in real time and during post-survey inspection of imagery. Methods of body scoring described by Wachtendonk et al. (2022) were adopted and applied to Fathom Pacific's existing body scoring criteria definitions.

Body scoring definitions:

Good body condition

- Dorsal ridge somewhat visible but not pronounced.
- Well-rounded appearance.
- No vertebrae visible.
- No scapular visible.
- No post cranial depression.

Moderate body condition

- Definite, pronounced dorsal ridge.
- Some vertebrae visible.
- No scapular visible.
- No post cranial depression.

Poor body condition:

- Definite dorsal ridge.
- Multiple vertebrae visible.
- Scapular visible.
- Clear, post cranial depression.

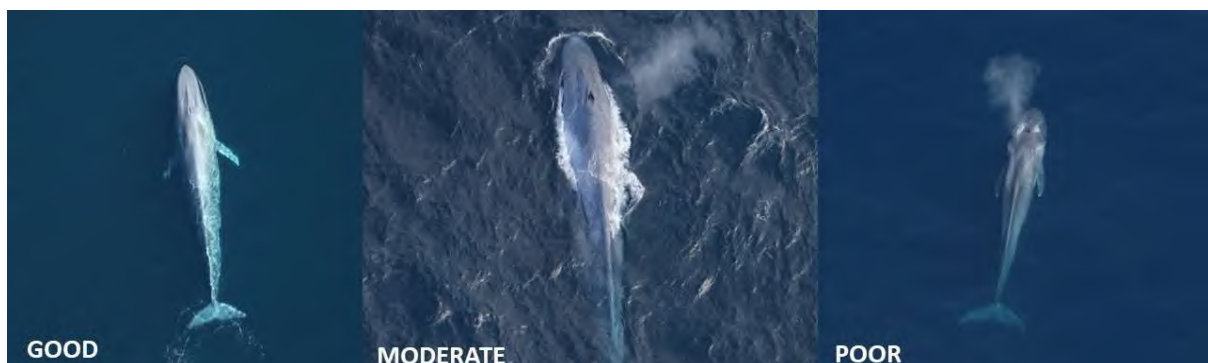


Figure 2-3 Examples of blue whale body conditions. Images by Fathom Pacific.

2.3. Data and imagery management

All data collected during the aerial cetacean surveillance program were downloaded and backed-up upon completion of each survey day. These data were then processed through a strict QAQC system before being approved for upload to Fathom Pacific's inhouse spatial relational database (CetaMAPS). Where possible, blue whale sightings were supported with imagery. These images (as well as all other sighting imagery) were assigned image pathway links within the database to ensure ease of access for future querying of the database.

2.4. Data analysis

Data were analysed using R version 4.1.0 (R Core Team, 2018). Observations were subsetted to identify key trends for species of interest for this report. Data analysis uses only data recorded while on effort.

Data were subsetted by taxa, including cetacean taxa and other species observed during the aerial surveys. Key taxa of interest for this report include the humpback whale and blue whale, and the temporal and spatial distribution of these species was analysed and discussed to understand seasonal trends and highlight key distribution areas. Where appropriate, other whale taxa observed during surveys were also discussed.

Analysis of observation were completed to:

- Understand diversity and taxa richness.
- Study temporal distribution of sightings (used to understand presence of seasonal trends).
- Study spatial distribution of sightings.
- Compare humpback whale and blue whale temporal and spatial distribution and potential links to surface krill observations.
- Compare observed behaviours.

2.5. Data reporting

Regular data reporting was required during the project period. This involved raw data exports, as well as written reports to fulfill permit requirements such as reporting to government agencies, and animal ethics committees. Survey updates were also provided to relevant state government departments by ConocoPhillips Australia. A comprehensive report detailing survey results from flights over the Zeehan and Apollo Marine Parks will be prepared for the Director of Marine Parks upon completion of all surveys.

3. Results and Discussion

3.1. Survey Details

A total of 17 aerial surveys (Figure 3-1) were flown between 8 August 2022 and 2 June 2023. One survey was abandoned mid-flight, due to unexpected low cloud across the survey area. The results presented below include on-transect data and off-transect (i.e., incidental) data.

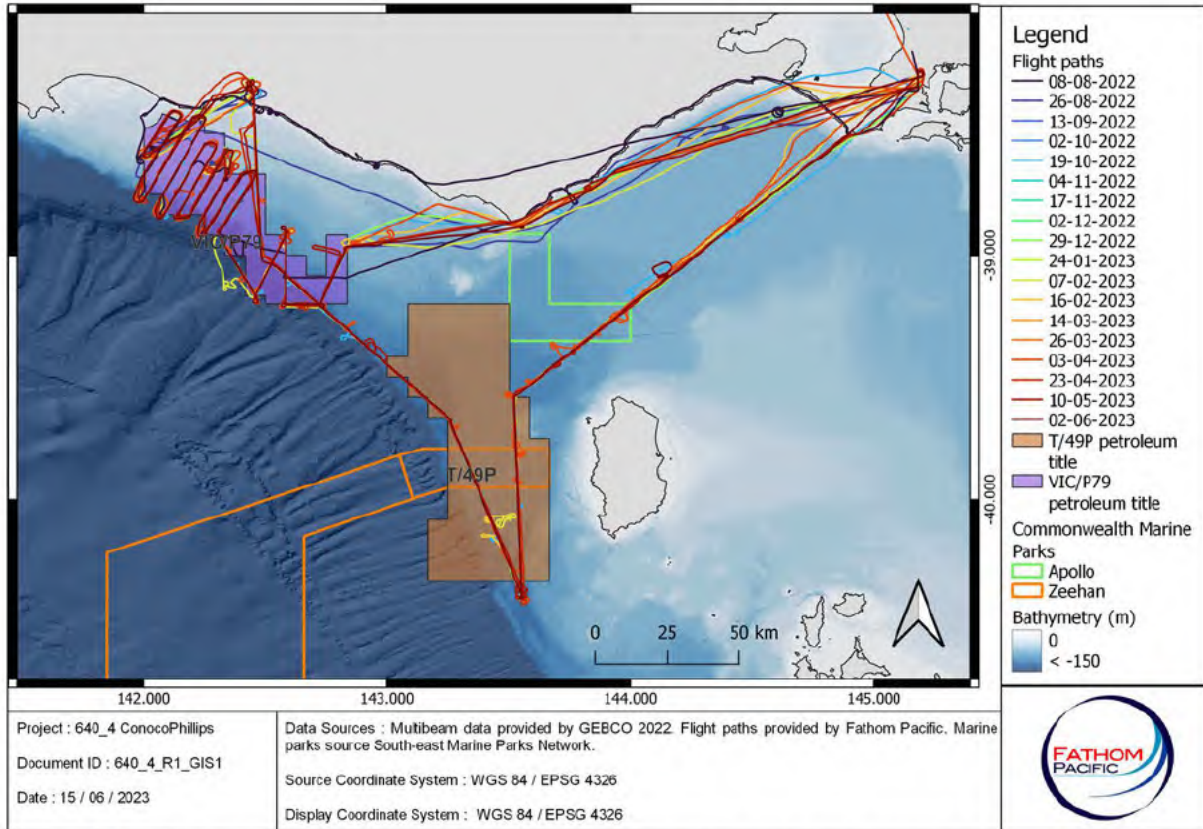


Figure 3-1 Flight paths flown during aerial surveys with the Zeehan and Apollo marine parks and VIC/P79 and T/49P lease areas shown.

A summary of the time spent on effort and the area covered during surveys between August 2022 and June 2023 (inclusive) is presented in the tables below (Table 3-1 and Table 3-2).

Table 3-1 Survey statistics.

Total minutes on effort	3665 minutes
Total distance surveyed	13,174.39 km
Total area surveyed on effort (km²)	64,383.26 km ²

Table 3-2 Table summarising temporal distribution of flights and key flight statistics.

Date	Season	Total survey time on effort (minutes)	Total distance surveyed (km)	Total area surveyed whilst on effort (km²)
8/08/2022	Winter	178	595.437	2909.902
26/08/2022	Winter	116	410.998	2008.546
13/09/2022	Spring	101	391.959	1915.502
2/10/2022	Spring	238	751.029	3670.278
19/10/2022	Spring	224	751.029	3670.278
4/11/2022	Spring	213	791.931	3870.165
17/11/2022	Spring	199	791.931	3870.165
2/12/2022	Summer	235	791.931	3870.165
29/12/2022	Summer	199	791.931	3870.165
24/01/2023	Summer	222	912.850	4461.099
7/02/2023	Summer	216	791.931	3870.165
16/02/2023	Summer	225	791.931	3870.165
14/03/2023	Autumn	219	706.525	3452.790
26/03/2023	Autumn	216	791.931	3870.165
3/04/2023	Autumn	220	791.931	3870.165
23/04/2023	Autumn	212	791.931	3870.165
10/05/2023	Autumn	204	763.596	3731.694
02/06/2023	Autumn	189	763.596	3731.694

Temporal distribution of area surveyed during each flight across the program is shown in Figure 3-2. The number of total sightings recorded in each flight was variable and the distribution between petroleum titles (Figure 3-2), shows that most sightings were recorded in VIC/P79, as influenced by the study design and the different number of transects flown within each. In both regions, recorded whales were classified as belonging to three main groups: humpback whales, blue whales and other whale taxa, aggregated in Figure 3-3.

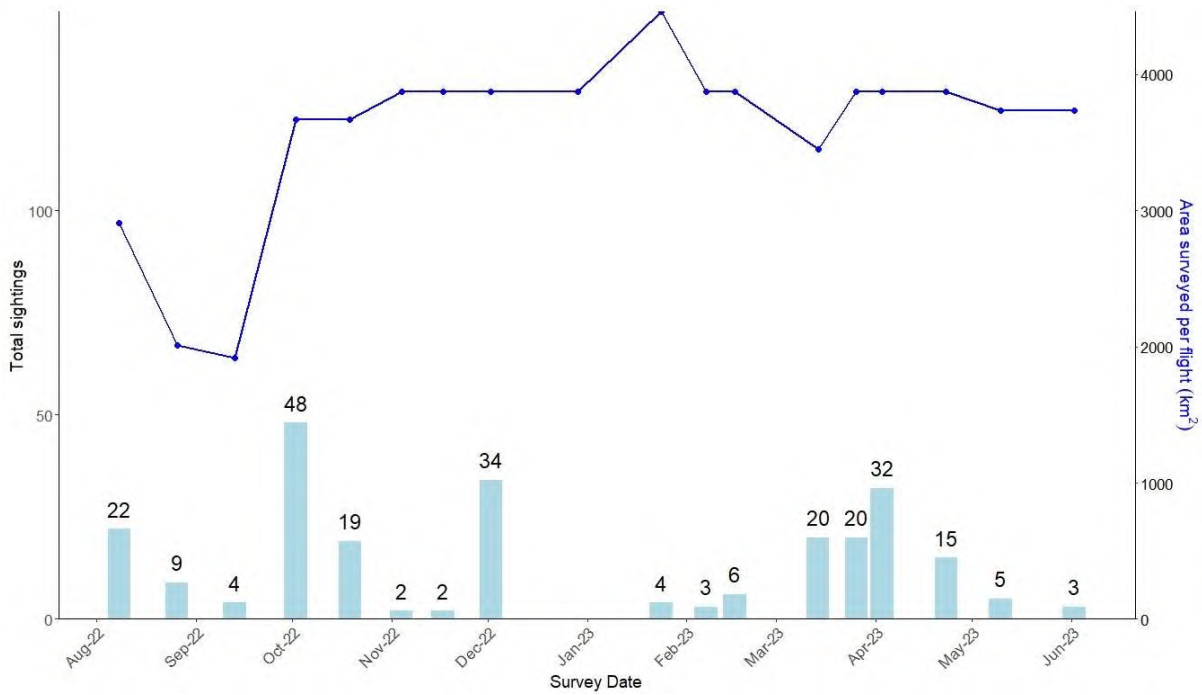


Figure 3-2 Total area surveyed during each flight (blue line) and number of whale sightings recorded during a flight.

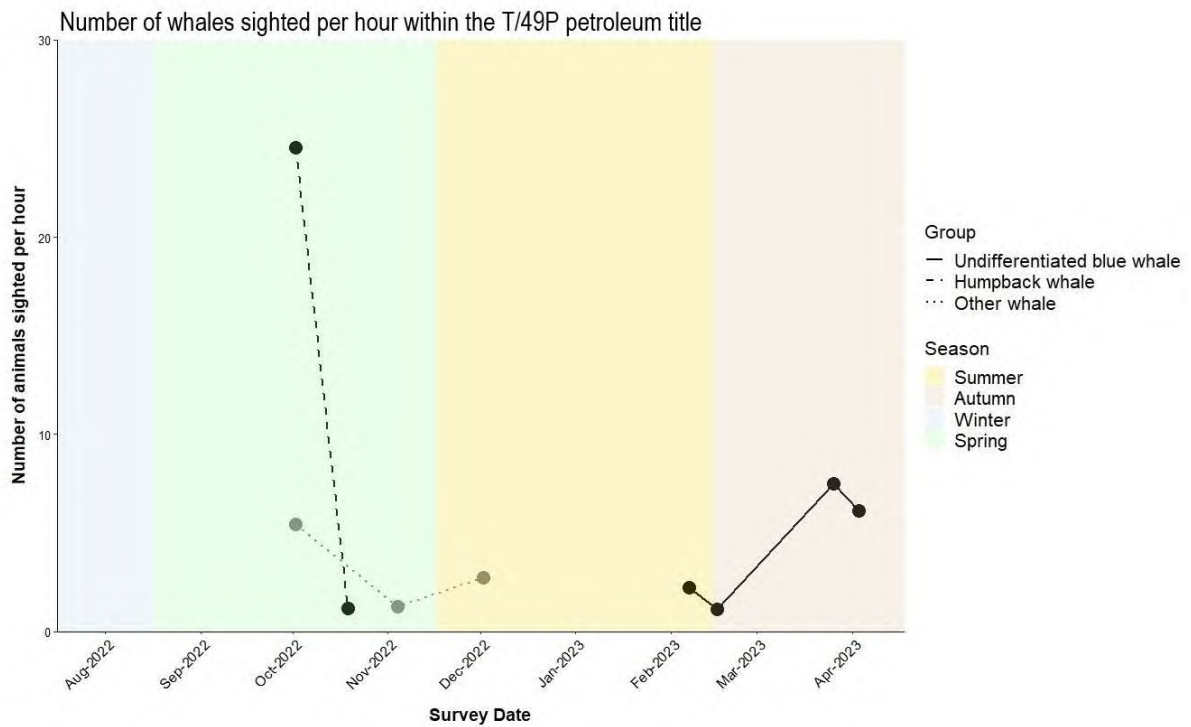
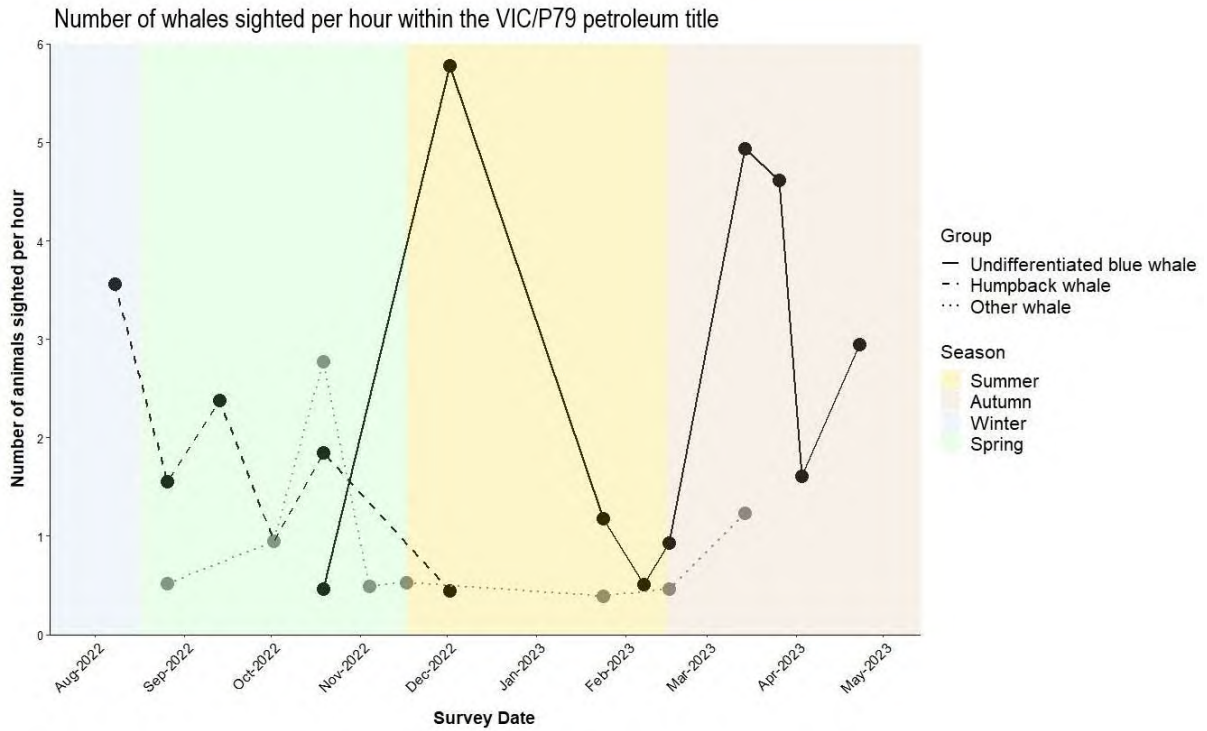


Figure 3-3 Number of sightings recorded per hour during the survey period in the two lease areas, VIC/P79 (top) and T/49P (bottom).

3.2. Cetacean species richness

Cetaceans were detected on every survey flight in varying numbers across the survey area and nearby waters (Figure 3-4 and Figure 3-5). A total of 12 cetacean species were recorded within or near to VIC/P79 and T/49P, including:

- blue whale (presumed pygmy blue)
- southern right whale
- fin whale
- sei whale
- humpback whale
- Bryde's whale
- dwarf minke whale
- sperm whale
- killer whale
- long-finned pilot whale
- bottlenose dolphin
- common dolphin

In addition to the above species, a number of observations were made where species level identification was not possible. These sightings were either too distant, too brief or lacked key diagnostic features during the observation and within imagery. To ensure these observations were captured, all unidentified cetaceans were categorised into the following criteria:

- unidentified large whale
- unidentified small whale
- unidentified rorqual
- unidentified beaked whale and
- unidentified dolphin.

These data entries were often accompanied by a brief description of the observation which allowed for further consideration during the QAQC data process.

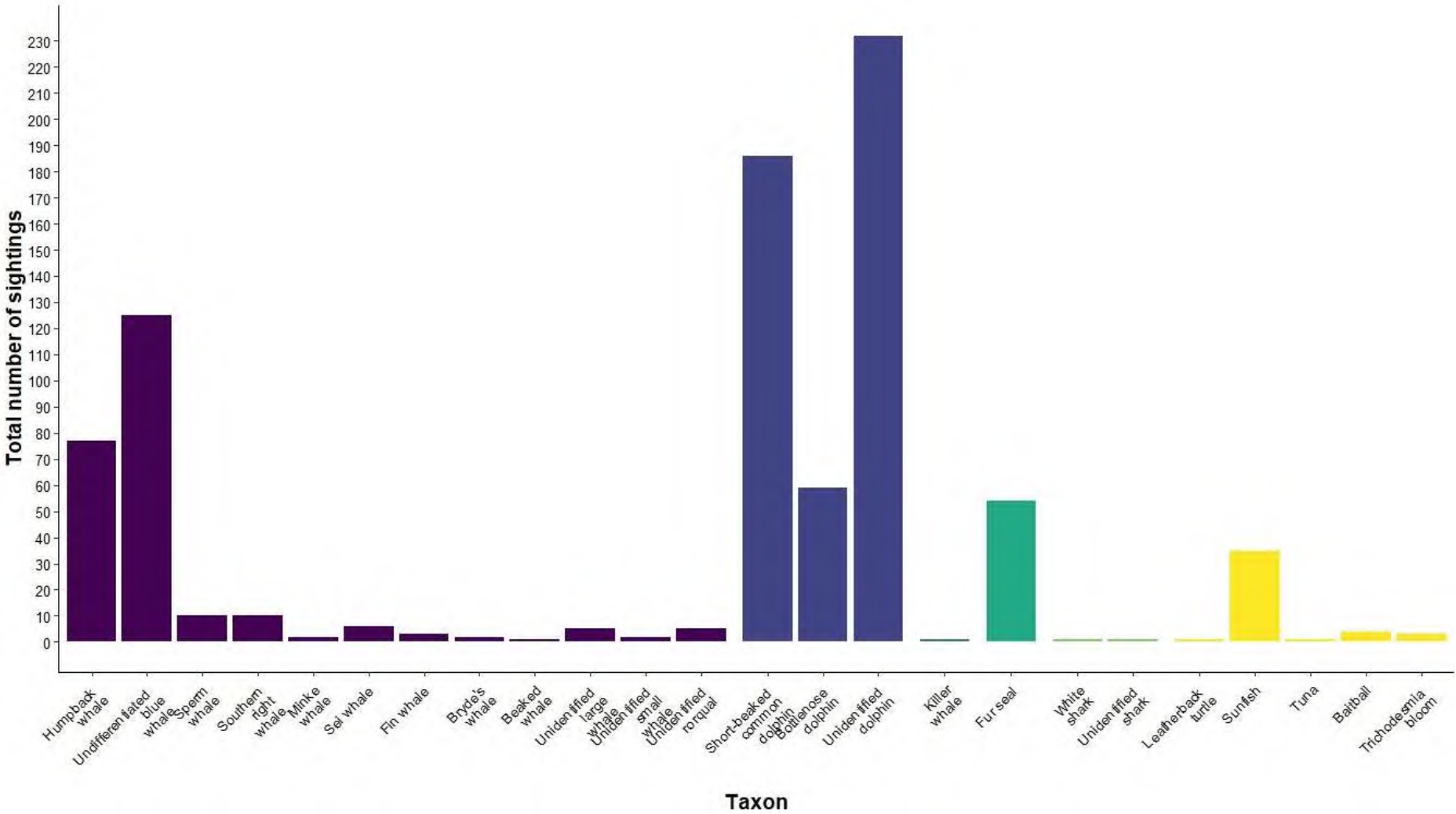


Figure 3-4 Total number of sightings per taxa and other observations of interest recorded across all aerial surveys. Each whale sighting represents one whale, each dolphin sighting represents a pod of animals. Different colours represent taxon groups (whales, dolphins, other marine mammals, other relevant ecological features).

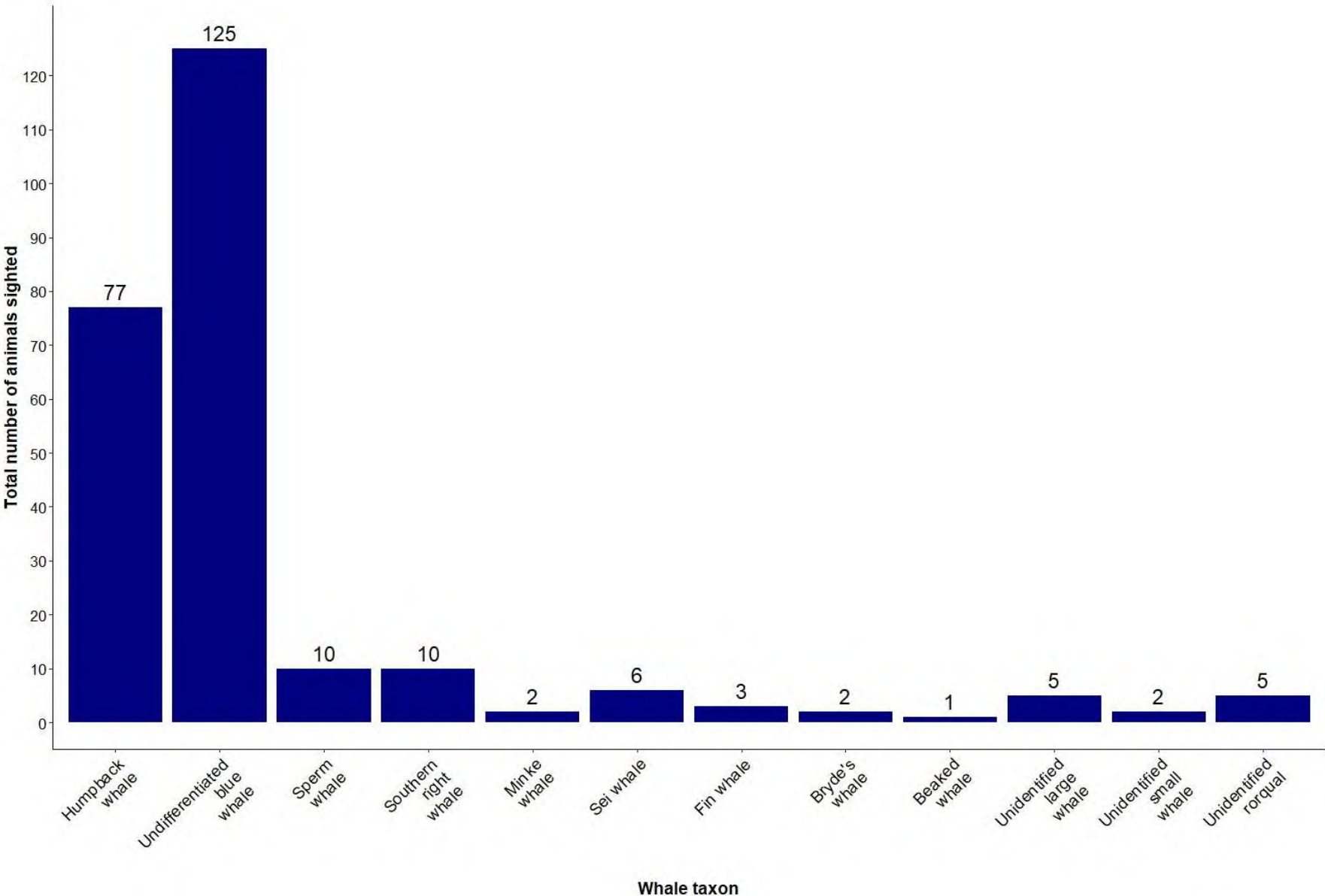


Figure 3-5 Total number of whales recorded across all aerial surveys.

3.3. Spatiotemporal patterns of whale occurrence

3.3.1. Blue whales

Aerial surveys between 8 August 2022 and 2 June 2023 made 69 detections of 125 blue whales (Figure 3-6). The first sighting occurred on 2 October 2022 in close proximity to VIC/P79 (Figure 3-7). Subsequent sightings occurred irregularly until a marked increase in sightings in December (30 whales), followed by a decrease in sightings, and then a slow increase leading to peak in April (40 whales), followed by a marked decline in May/June (3 whales).

Key observations:

- October 2022 marks the arrival of small numbers of blue whales, presumed to be pygmy blue whales, one in VIC/P79 and two in central Bass Strait.
- A peak in numbers of blue whales in December 2022.
- A second peak in blue whale sightings within the survey area in March and April 2023.
- One sighting of a blue whale cow/calf pair on 7 February 2023.
- The presence of extensive areas of dense surface krill swarms across the survey area with only some of these areas apparently being utilised by blue whales. However, as krill can occur at any depth, it is possible some blue whales were not detected because they were subsurface while feeding on krill swarms at depth.
- General observations obtained early in the season (September – November 2022) indicated some blue whales to be in poor to moderate body condition.
- Observations through ‘peak season’ (December–April) showed the majority of blue whales to be in moderate to good body condition.

Aerial surveys flown prior to those reported on here (but also commissioned by ConocoPhillips Australia), detected blue whales in the months of September (two whales) and October (one whale) 2021. These detections were made in the eastern half of T/49P and represent the earliest seasonal records for the region (Peter Gill pers. comm.).

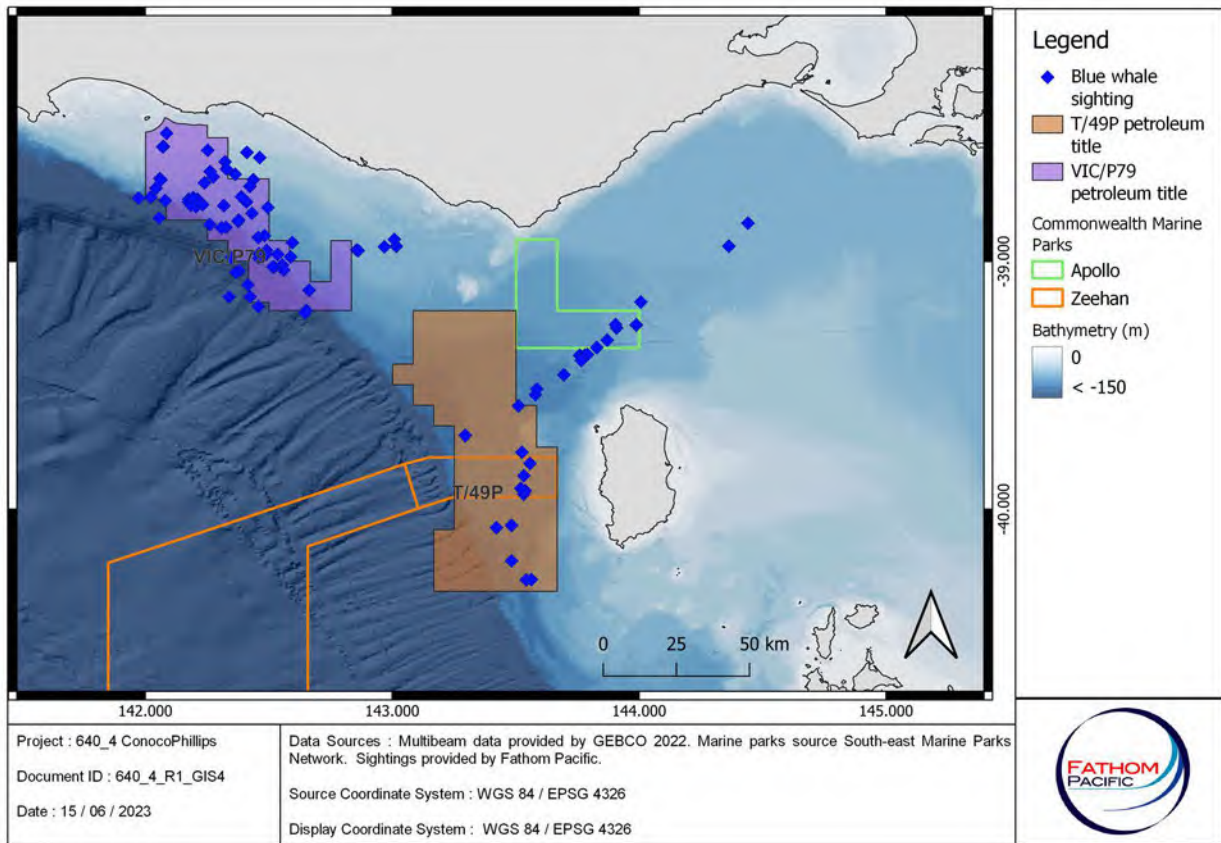


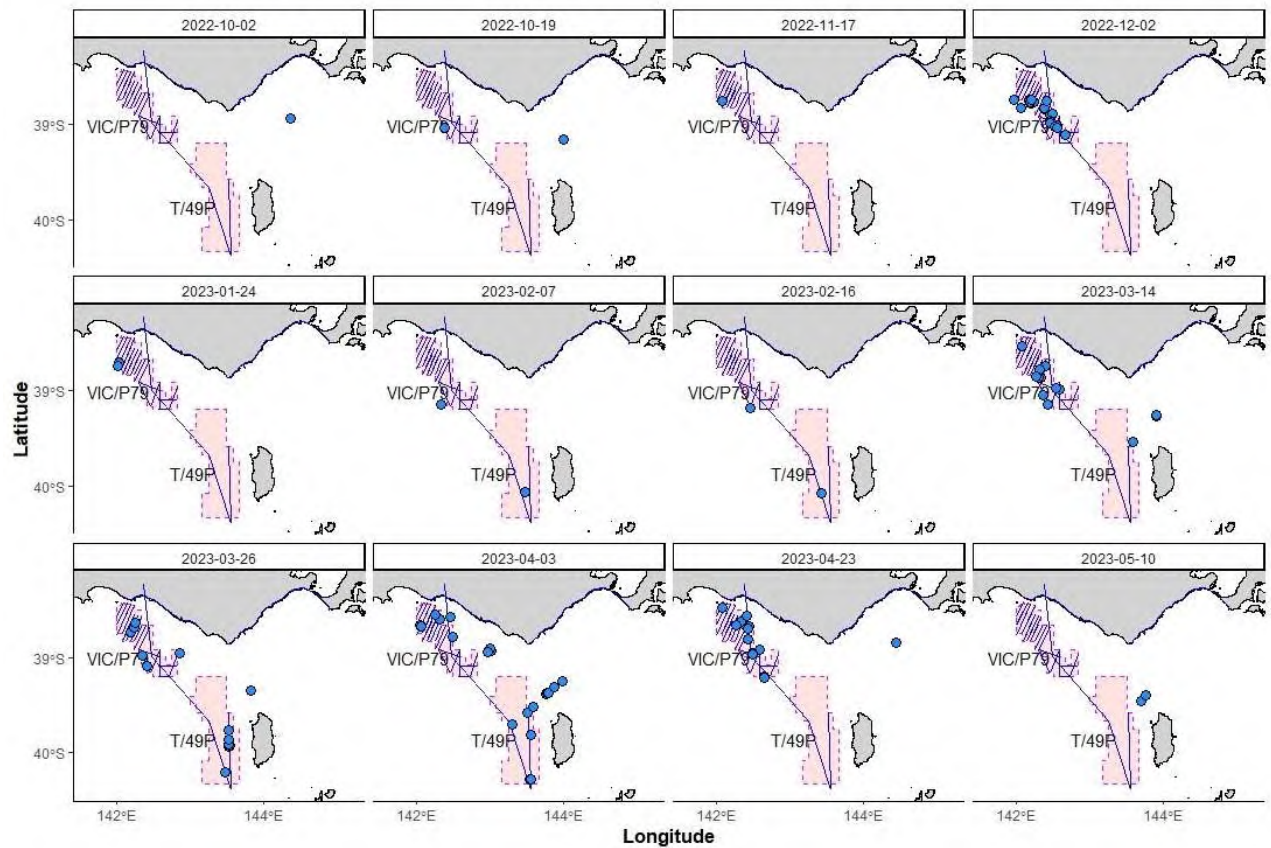
Figure 3-6 Location of validated blue whale sightings over the survey period (August- May).



Figure 3-7 Blue whale (likely pygmy blue) on 2 October 2022.



Figure 3-8 Blue whale (likely pygmy blue) cow/calf pair on 7 February 2023.



Note: Figure 3-9 does not include flight data from when blue whales were not detected.

Figure 3-9 Spatial distribution of blue whales sighting across flights. Blue line shows transect lines.

3.3.2. Humpback whales

These detections were represented by 74 individual humpback whales from across the survey area and nearby waters. The presence of this species was largely concentrated in the western portion of VIC/P79 and the southern half of T/49P, with the spread of incidental sightings from west of Cape Otway to central Bass Strait (Figure 3-10).

Humpback whale detections totalled 31 between the months of August 2022 and June 2023 (Figure 3-11). No humpback whales were observed between January and April (inclusive). The majority of humpback whales detected during September to November were observed to be surface or shallow subsurface feeding at the time of sightings. These observations were occasionally, but not always, coupled with observations of surface krill and often involved multi-species assemblages, usually including common dolphins, fur seals and piscivorous and krill-eating seabirds.

One observation of a humpback whale cow/calf pair was made in central Bass Strait on 19 October 2022. The position of the calf was observed to be below the adult and in a posture that suggested the calf to be nursing at the time (Figure 3-12).

Traditionally, the known migratory pathway of humpback whales has typically been assumed to be largely a north/south orientation along the east coast of Australia (Gales et al. 2009). Evidence gathered in recent years through satellite tagging and citizen science efforts, suggests a secondary migratory pathway exists through central and western Bass Strait. This pathway is assumed to intersect with the east Australian migratory corridor. Data gathered during the present study supports this hypothesis.

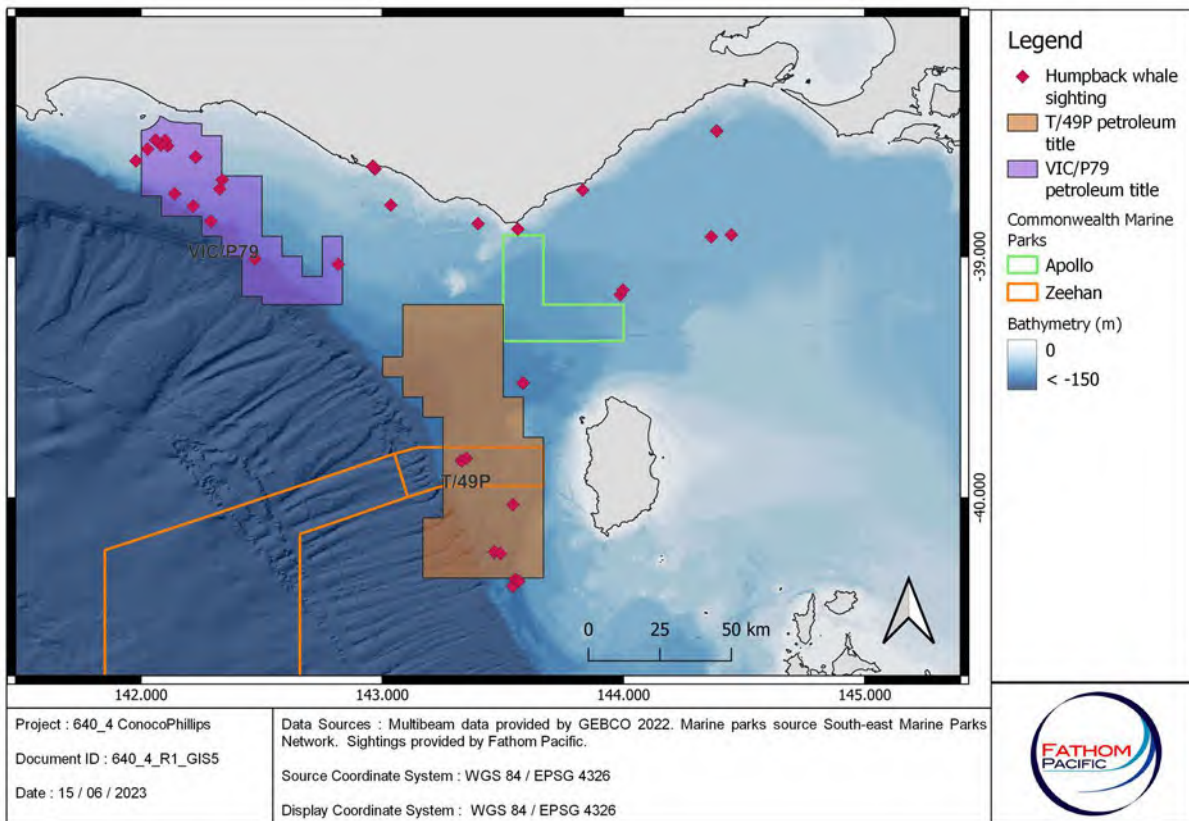


Figure 3-10 Locations of all humpback whale sightings during the survey period.

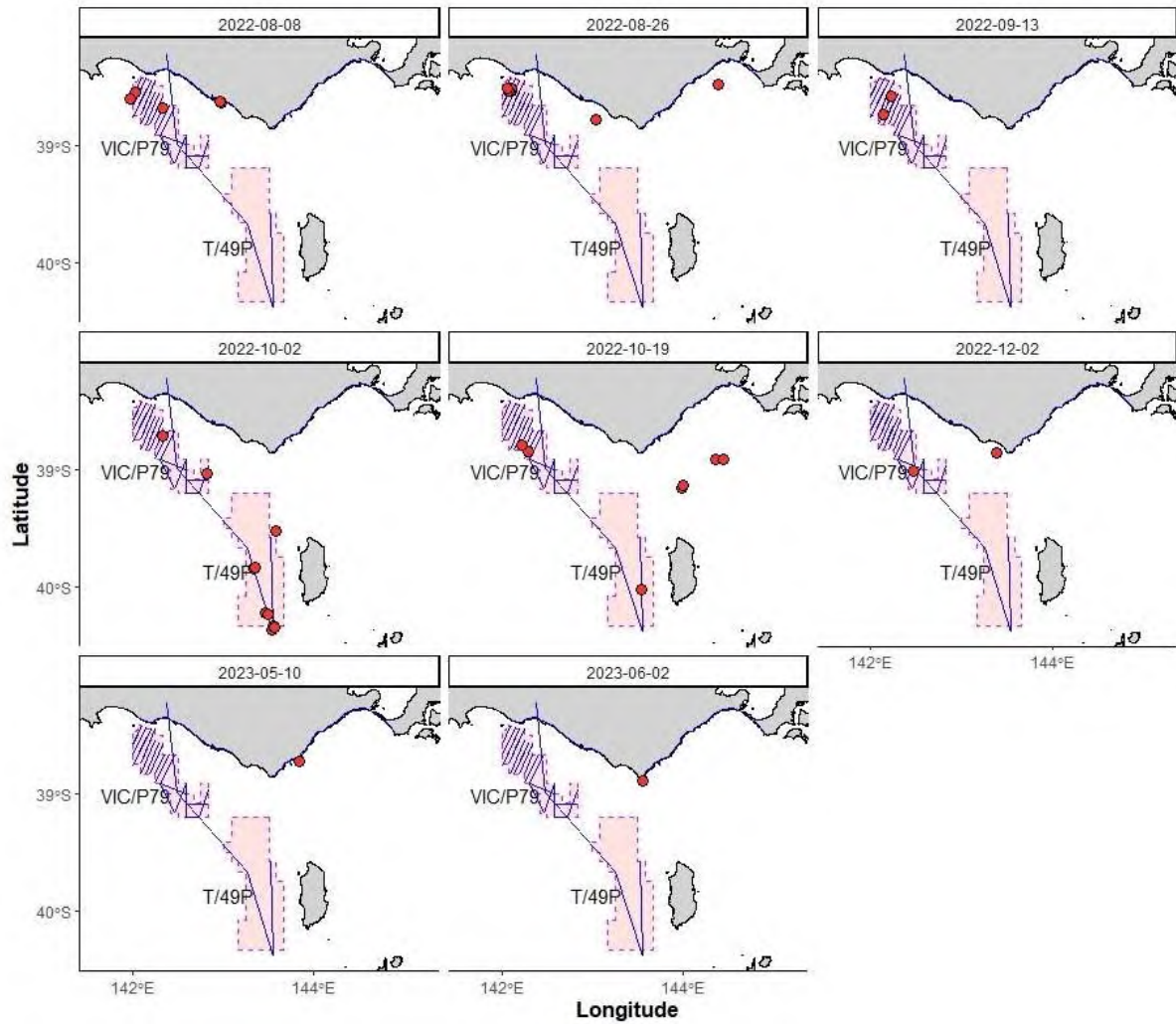


Figure 3-11 Spatial distribution of all humpback whale sightings. Blue line shows transect lines.



Figure 3-12 Humpback whale cow/calf pair. Arrows indicate calf pectoral fins protruding from beneath adult.

3.3.3. Sperm whales

Sperm whales were sighted on seven occasions and totalled 12 individual animals. Considering the relatively short amount of time spent surveying over known sperm whale habitat and the known extended diving behaviour of the species, this number of detections is notable. All but one sighting involved adult sized sperm whales that were presumed to be males (Figure 3-13). With the exception of one sighting, all detections were made at the southern end of Transect T_04 and the beginning of Transect T_05 within VIC/P79, off the continental shelf break (Figure 3-14). The far southern sighting occurred along transect SB_03 in an area on the continental shelf but appearing to be linked to a deep-water channel, possibly connected to the continental shelf break. This sighting was of two sperm whales, likely a cow/calf pair. The posturing of the smaller individual suggested possible nursing behaviour at the time of the sighting.



Figure 3-13. Sperm whale on T_05 south of VIC_P79.

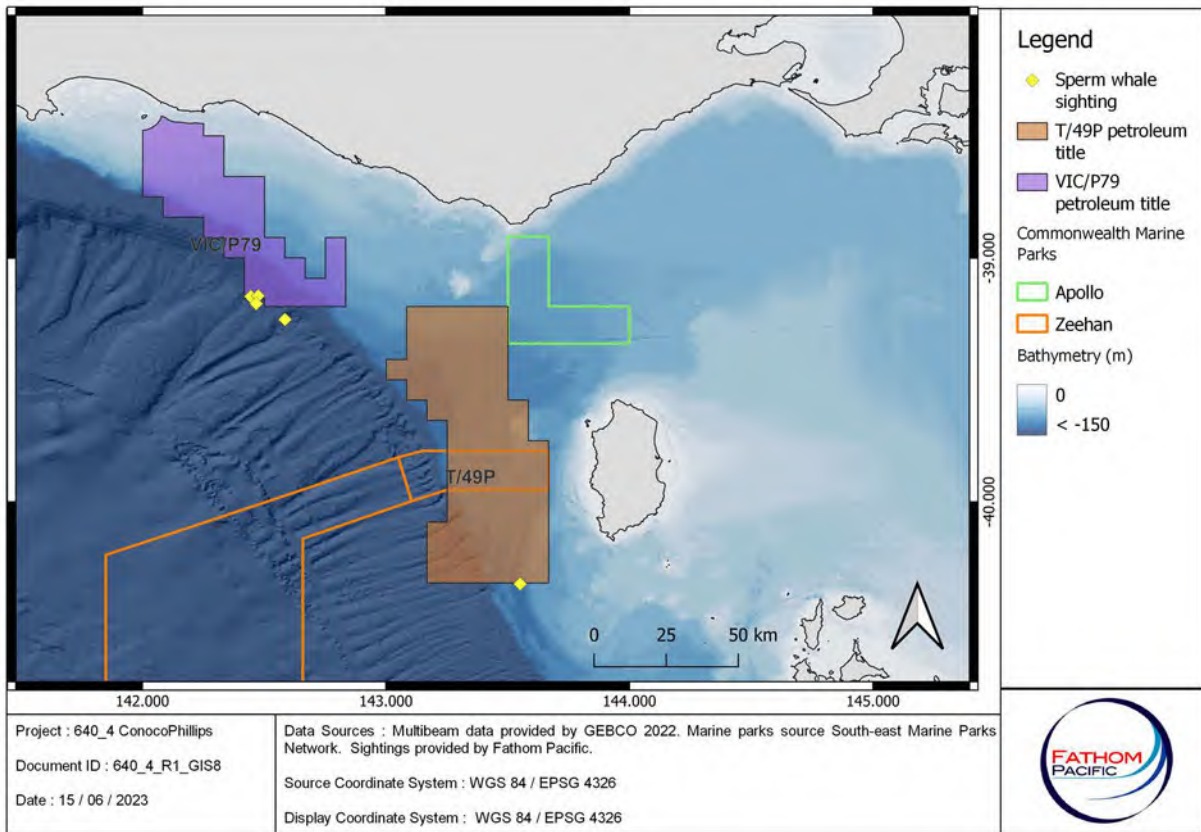


Figure 3-14 Locations of all sperm whale sightings during the survey period.

3.3.4. Other large whales

Large whale presence was variable between surveys with sightings spread across most of the survey area (Figure 3-15). Clusters of baleen whale sightings often coincided with observed feeding behaviours which were usually associated with visible surface krill swarms and seabird presence. Sei and fin whales were the most commonly sighted ‘other large whale’ species but remained in relatively low abundance (Figure 3-16).

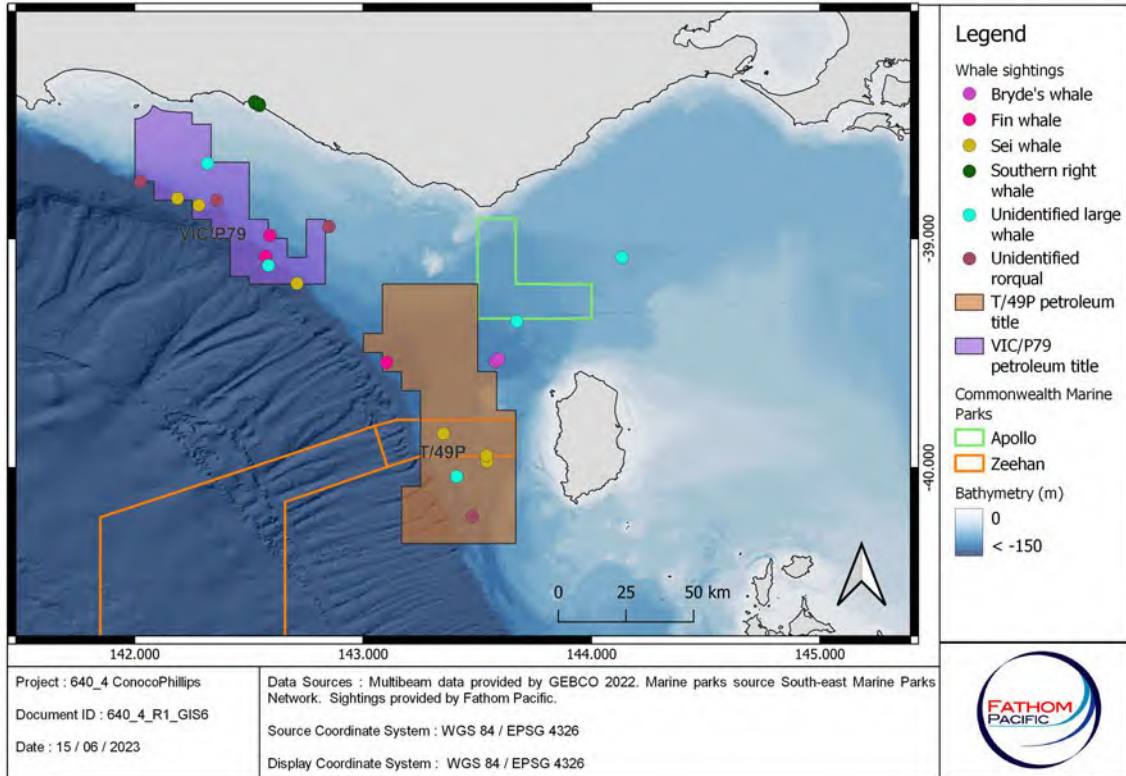


Figure 3-15 Locations of other large whale sightings.

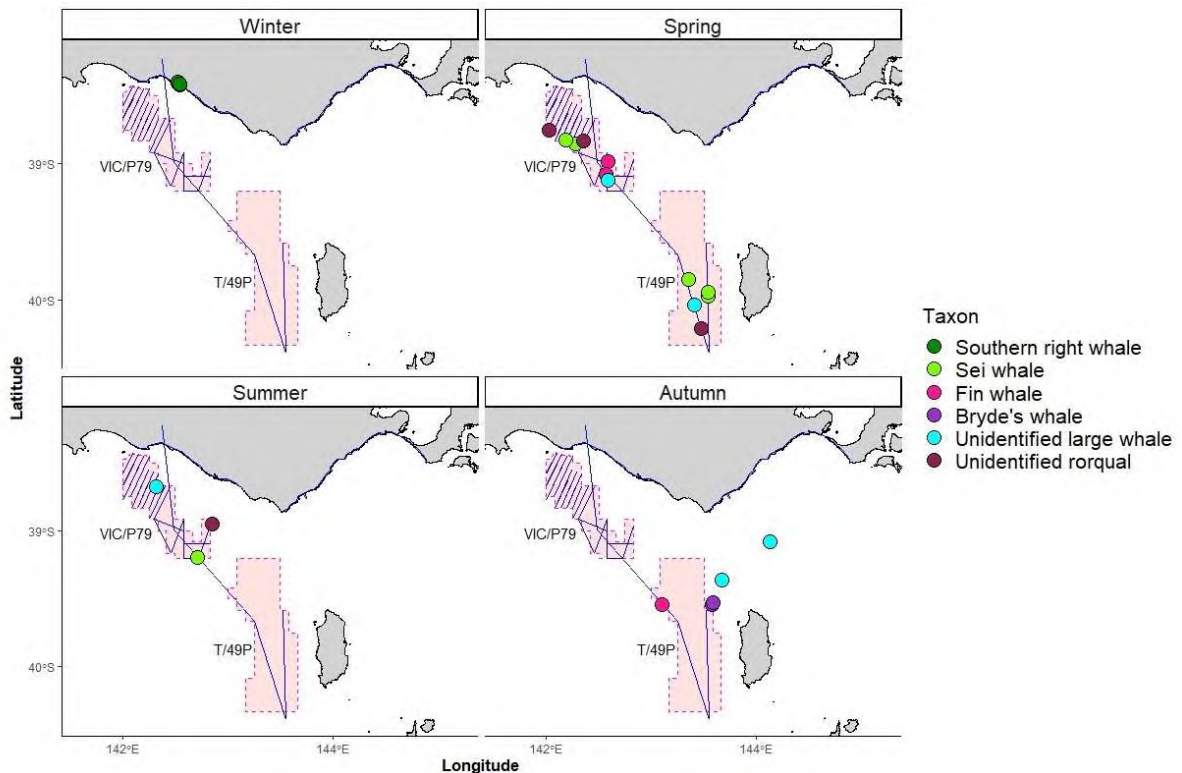


Figure 3-16 Seasonal distribution of other large whales during the survey period (August 2022-June 2023).

3.3.5. Sei whale

A sighting of a sei whale sighting occurred on 4 November 2022 (Figure 3-17). The individual presented with an unusual pale morphology not previously reported in sei whales (Robert Pitman pers. comm.). The pale colouration extended from the ventral side of the animal high onto the flank, as opposed to the ‘normal’ demarcation in colouration occurring just above the ventral line. Imagery from this event was shared with taxonomic experts both within Australia and overseas for review and comment. Based on evidence of a definite dorsal ridge and apparent post cranial depression, this animal appears to be in poor body condition.



Figure 3-17 Sei whale presenting with a pale morphology, 4 November 2022.

3.3.6. Small whales

Observations of small whales were limited to minke whales (two records), unidentified beaked whales (one record) and unidentified small whales (two records). These records while low in number, add context to the high biodiversity of cetacean species within the region (Figure 3-18).

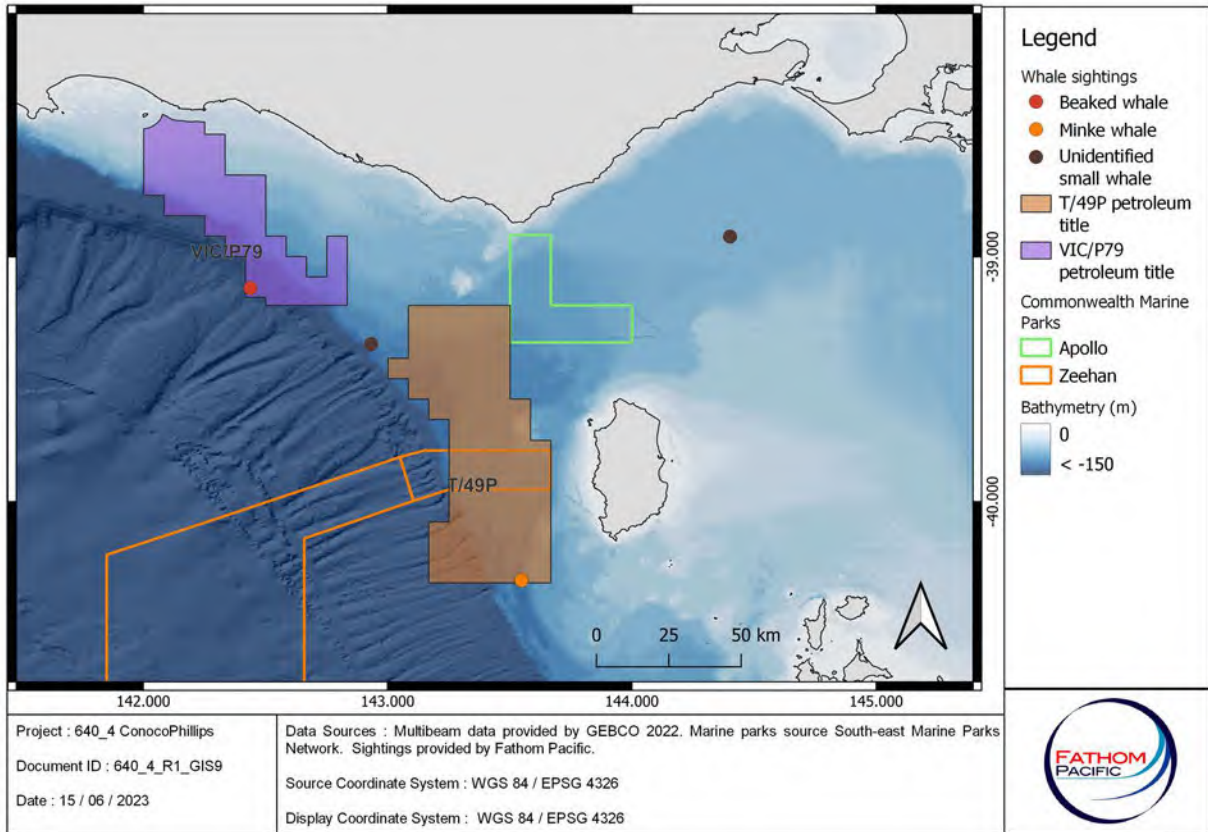


Figure 3-18 Locations of small whale sightings.

3.3.7. Other species and ecological features

The Otway Basin region is recognised as an area of seasonally high productivity. Cool nutrient rich waters upwelled in the region leads to an increase in phytoplankton abundance and supports high productivity. These primary producers form the basis of multiple food webs which support many species such as krill, sardines and other baitfish, and apex predators including baleen whales, bottlenose dolphins, common dolphins, Australian fur seals, gannets, and southern blue fin tuna (Goldsworthy et al., 2011; Johannes and Young, 1999; Rogers et al., 2013).

An increase in phytoplankton abundance during upwelling events can attract krill to the region. *Nyctiphanes australis*, a coastal krill, is abundant on the continental shelf off southeast Australia (including Tasmania) and is the principal euphausiid species in this region (Johannes and Young 1999). *Nyctiphanes australis* forms an important link to higher trophic levels and is thought to be an important prey source for baleen whales including blue and humpback whales (Gill, 2002; Johannes and Young, 1999; Morrice, 2014; Stamation et al., 2007). The species is known to form surface and subsurface swarms, during upwelling seasons in the GSACUS surface swarms of *N. australis* have frequently been observed (Gill et al., 2011; Johannes and Young, 1999). The presence of sub-surface swarms has often been inferred from sightings of blue whales rising to the surface with distended throat pleats, with no surface swarms visible nearby (Peter Gill pers. comm.). Gill (2002) found the distribution of blue whales closely aligned with the distribution of *N. australis* in this region.

Krill swarms were recorded sporadically on all but one survey (8 August 2022). Observations of krill swarms varied in size from ~10 m diameter to over 100 m. Surface swarms typically increased in frequency and size in the southern half of transects within VIC/P79 and T/49P and were consistently observed along the shelf break. The presence of surface krill swarms across the extent of the survey area is indicative of an increased level of productivity.

Areas of high krill density were often coupled with the presence of a range of predators which included krill-eating birds, dolphins, seals and baleen whales (Figure 3-19).



Figure 3-19 Humpback whale feeding on a krill swarm in T/49P

Humpback whale density was relatively high in T/49P in proximity to the continental shelf break. Surface krill swarms were present during these observations which often coincided with observations of feeding humpback whales (Figure 3-20). These observations suggest a relatively high level of productivity was being generated in the area.



Figure 3-20 Feeding group of humpback whales in T/49P.

In addition to krill observations, a high number of sunfish were recorded on 19 October 2022 (Figure 3-21). In all, a total of 18 sunfish were observed on this survey with the majority of sightings being within T/49P and on transit to Tyabb (Figure 3-22). Other than this event, only one sighting of a single sunfish was made on 4 November 2022, and no sightings were recorded in the 2021 survey.

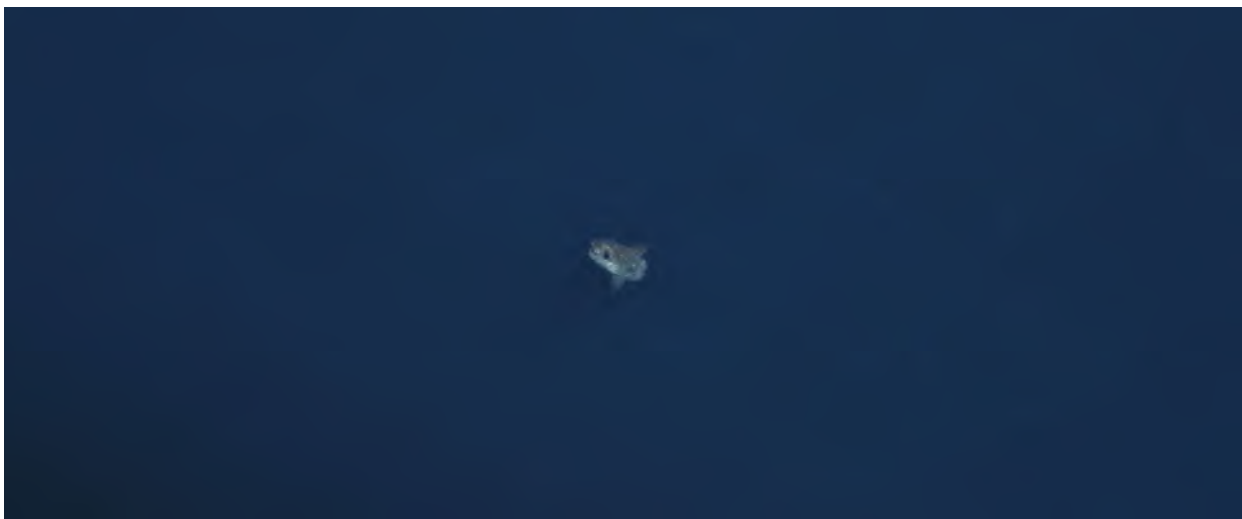


Figure 3-21 One of 18 sunfish documented on 19 October 2022.

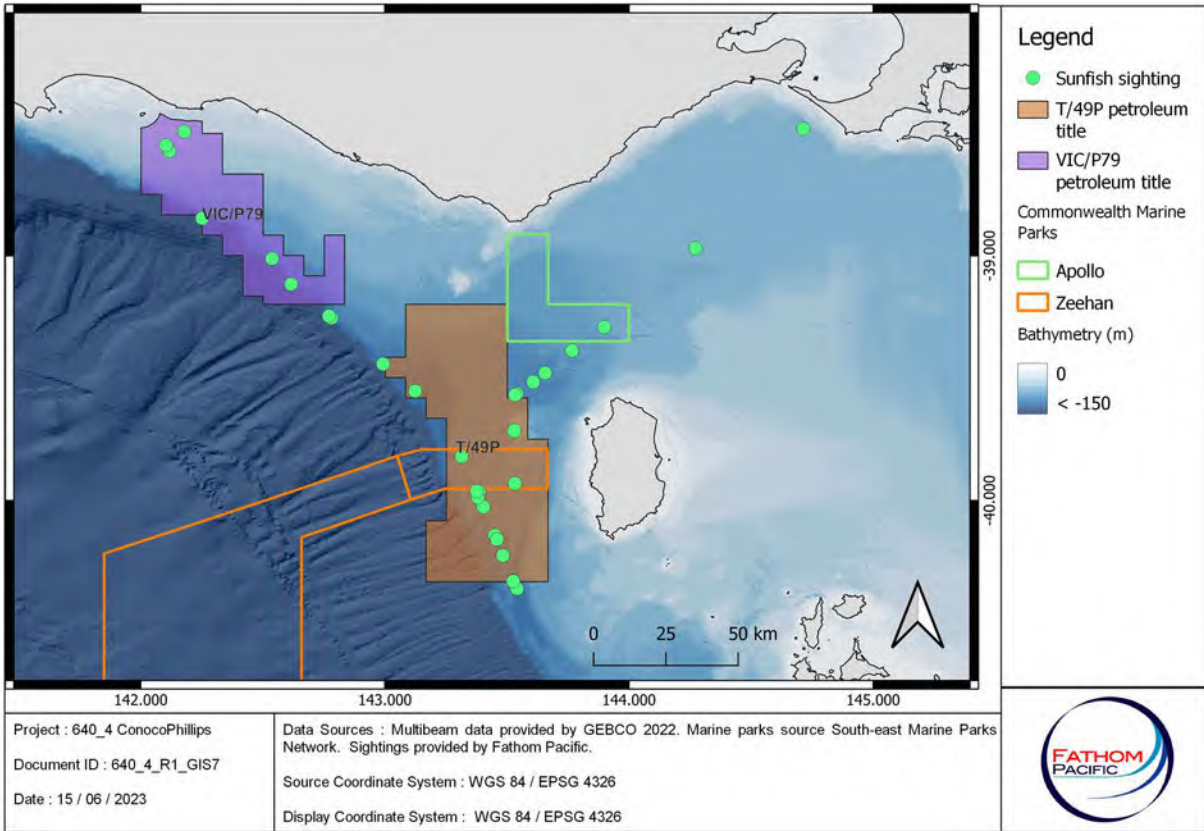


Figure 3-22 Sunfish sightings.

3.4. Areas of significance and regional context

Both VIC/P79 and T/49P overlap an area of high productivity and seasonal upwelling and intersect seasonally occupied biologically important areas (BIAs) for cetaceans, including:

- The foraging and, in part, the foraging (high density) areas for pygmy blue whales, and
- The known core range and, in the northern extent of VIC/P79, the aggregation area for southern right whales.

The petroleum titles do not overlap the foraging BIA for sperm whales, which is located off the coast of South Australia, or the migration BIA for humpback whales located on the east and south-west to west coasts of Australia.

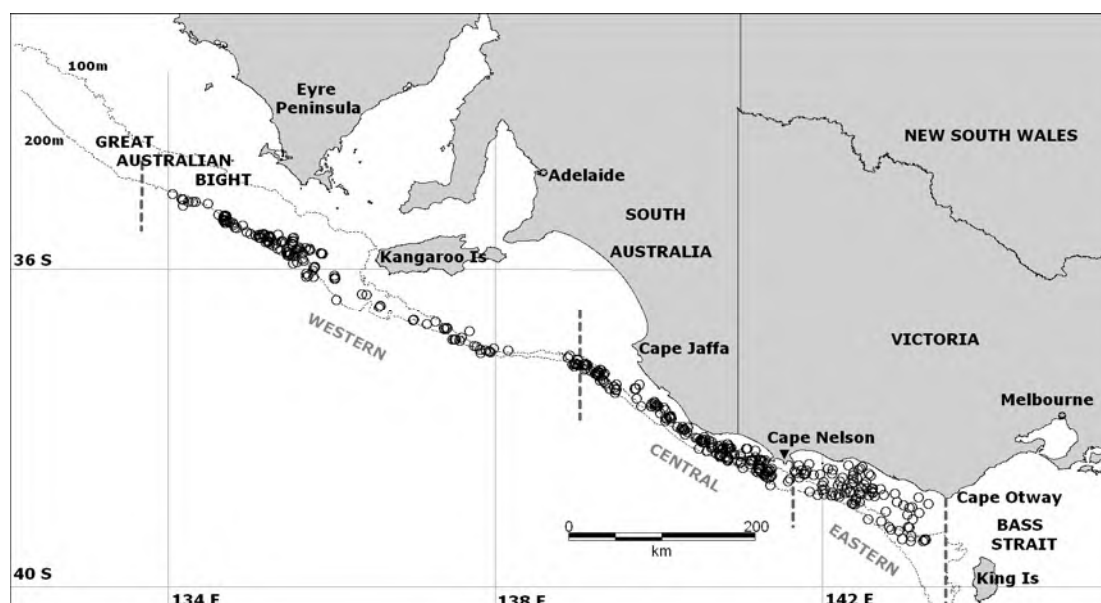
The results of the present study in combination with historical data align with designated BIAs, in that the region is seasonally inhabited by blue whales and used as a foraging area. Blue whales are expected to be observed in higher numbers during the November-April period, which coincides with the GSACUS season and other regional productivity enhancement processes. Sightings of blue whales in the Western Victorian region between June-October can occur but are considered rare.

Gill et al. (2011) undertook 69 aerial surveys between January 2002 and May 2007 to establish the spatial and temporal variation of abundance and distribution of blue whales in the area extending from west of Kangaroo Island (~136°E, SA) to Cape Otway (VIC) during the Bonney Coast Upwelling season. Their total survey area was partitioned into western, central and eastern zones (Figure 3-23) and differentiated physio-graphically by variations in shelf width, shelf orientation and sea surface temperature (SST). The central zone lies along the narrow shelf where the Bonney Coast Upwelling surface plume is expressed (Gill et al., 2011). The eastern zone occupies the broader shelf between Cape Nelson and Cape Otway, which is also subject to a largely subsurface upwelling except for nearshore surface plumes during strong upwelling events (Gill, 2002; Levings and Gill, 2010). The VIC/P79 survey area partially overlaps the eastern zone of (Gill et al., 2011).

Gill et al. (2011) made the following observations during their 2002-2007 surveys with respect to blue whales:

- Blue whales were usually restricted to the western and central zones in November entering the eastern zone in December.
- Blue whales were widely spread through the central and eastern zones during January-April.
- In the eastern zone, encounter rates peaked in February (9.8 whales/1,000 km); dropping slightly to 8.8 whales/1,000 km in March; then declining to approximately 4 whales/1,000 km in April and to a single sighting in May (0.4 whales/1,000 km). Encounter rates in November were zero and in December is 1 whale/1,000 km.
- The central zone received less survey coverage than the eastern zone (20,339 km vs 24,380 km), yet more blue whales were sighted in the central zone, with the encounter rate in the central zone more than twice that in the eastern zone (11 whales/1,000 km vs 4.8 whales/1,000 km).
- Eighty percent (80%) of blue whales were encountered over seafloor depths of between 50 and 150 m and 93% of sightings occurred in water depths < 200 m in the eastern and central zones with 10% of sightings within 5 km of the 200 m isobath.

- The overall pattern of seasonal distribution suggest blue whales begin foraging in the western sector early in the upwelling season (around November), spread eastward through the central and eastern zones until April, then possibly contract toward the central zone prior to departure for wintering grounds.
- However, during aerial surveys in T/49P for Origin Energy in late 2012, large numbers of blue whales were observed on 10 November (21 whales) and 6 December (70 whales), the latter being the highest density of blue whales ever recorded in Australian waters (Peter Gill pers. comm.).



Source: Gill et al. 2011.

Figure 3-23. Example map showing western, central and eastern zones of the Gill survey area.

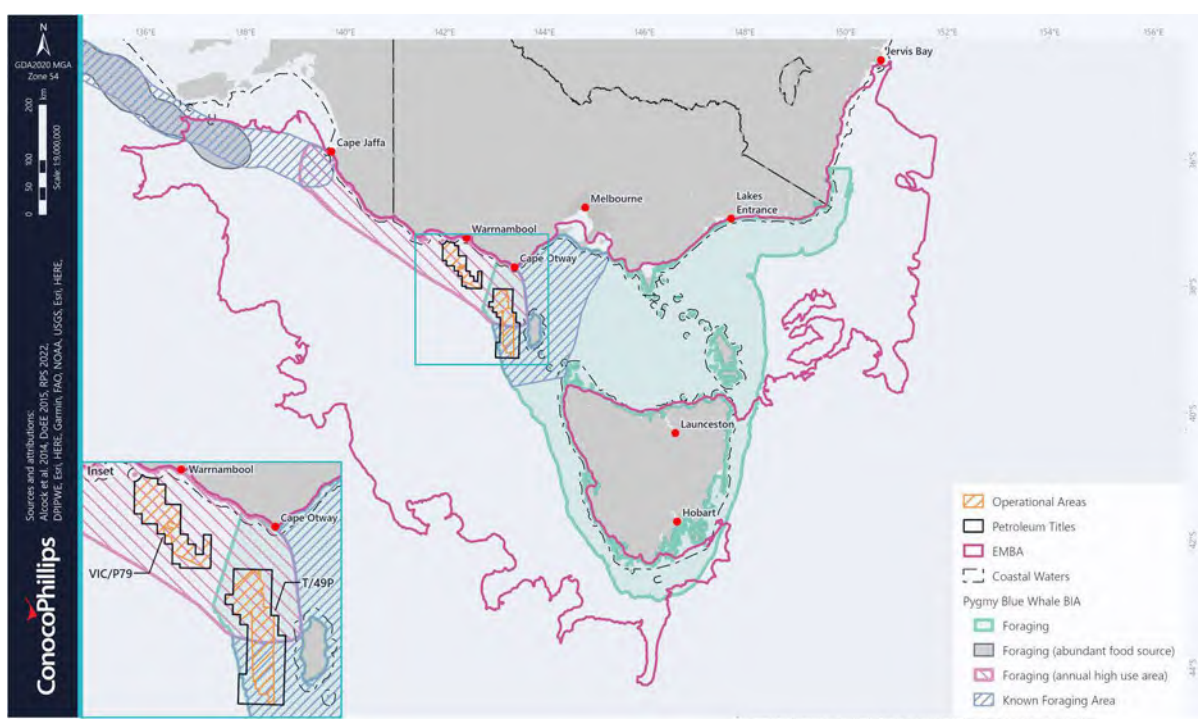
In relation to Gill et al. (2011), the ConocoPhillips Cetacean Surveillance Program found the following patterns of blue whale occurrence:

- Agreed that blue whale occurrence in the Gill Eastern Zone (Gill EZ) is low before December (one in September (2021 data), three in October 2022 and one in November 2022).
- January flights detected three blue whales, February three blue whales, March 33 blue whales and April 40 blue whales, representing a later extension of blue whale encounters.
- The Gill EZ was most consistently used by blue whales during periods where blue whales were present in the survey area.
- The maximum blue whale group size was eight animals (in central Bass Strait area north of King Island). Group sizes of two to five were recorded on several occasions throughout the Gill EZ, with one being the most common group size. One cow-calf pair was observed.
- One blue whale was sighted in the Gill EZ in November. Peak sighting months in this zone were December, February, March and April.

In addition, the ConocoPhillips Cetacean Surveillance Program found:

- In December, no blue whales were recorded on one flight and 30 blue whales recorded on another flight (maximum group size of four with feeding behaviour observed). This suggests productivity enhancement events may trigger short-term blue whale abundance increases.

2022–2023 aerial surveys have acquired data that shows blue whale occurrence further east than previously recorded by aerial surveys, but consistent with the known foraging BIA (Figure 3-24). These detections in the central Bass Strait region north of Tasmania, may indicate wider ranging movements of blue whales than previously reported. The present study indicates low blue whale occurrence before December, an isolated increase in abundance in early-December, and a pattern of increasing abundance from February with a peak in April. The seasonal signal in abundance is likely to be associated with temporal variation in the oceanographic processes underpinning productivity enhancements across the region (Figure 3-25, Figure 3-26, Figure 3-27).



Source: ConocoPhillips 2023.

Figure 3-24. Map showing blue whale BIAs and ConocoPhillips petroleum titles.

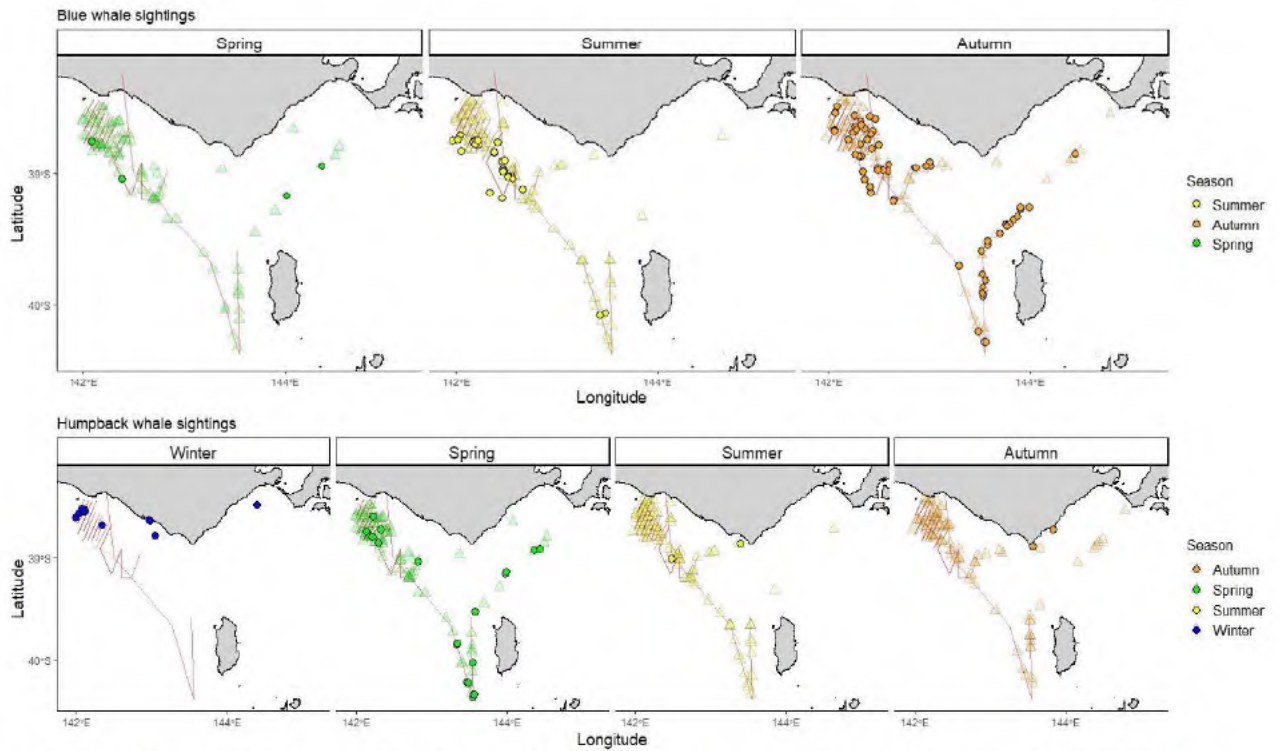


Figure 3-25 Spatial distribution of blue whales (top) and humpback whales (bottom) sightings by season. Krill is shown in background (triangle symbol). Red line shows the transects flown during the survey period.

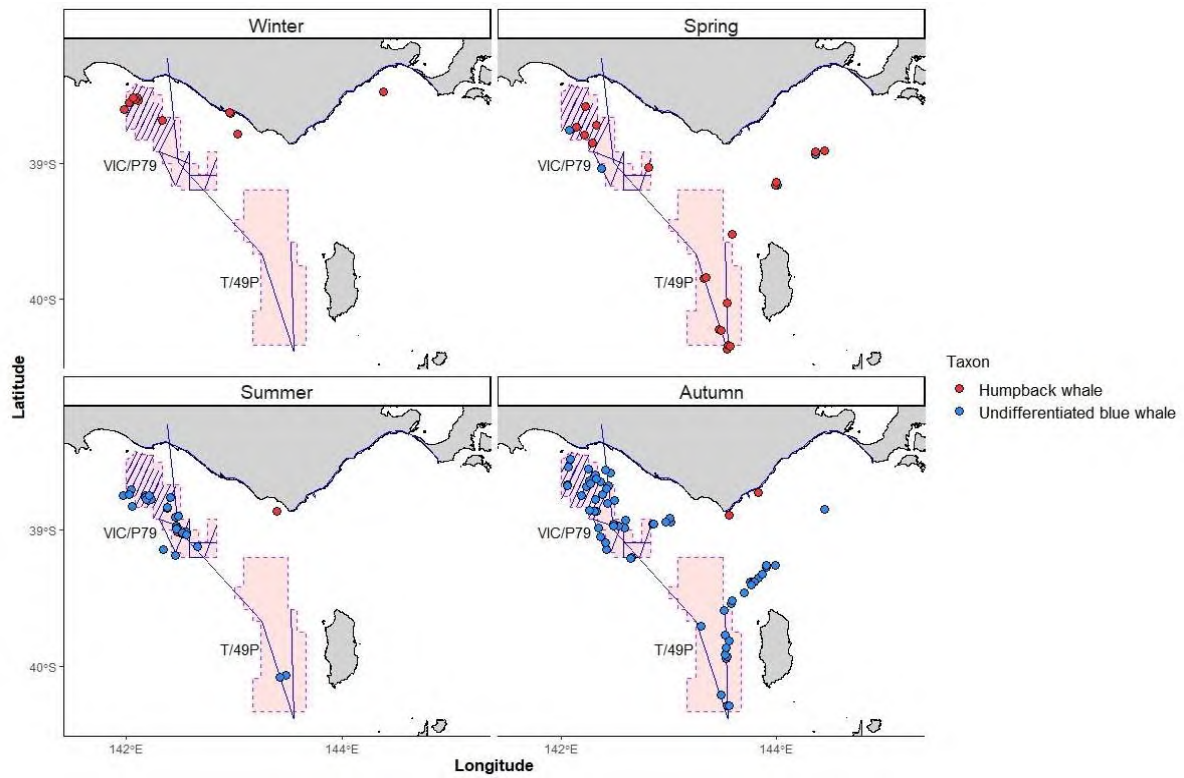


Figure 3-26 Location of blue whale and humpback whale sightings by season during the survey period (August 2022-June 2023). Blue line shows the transects flown during the survey period.

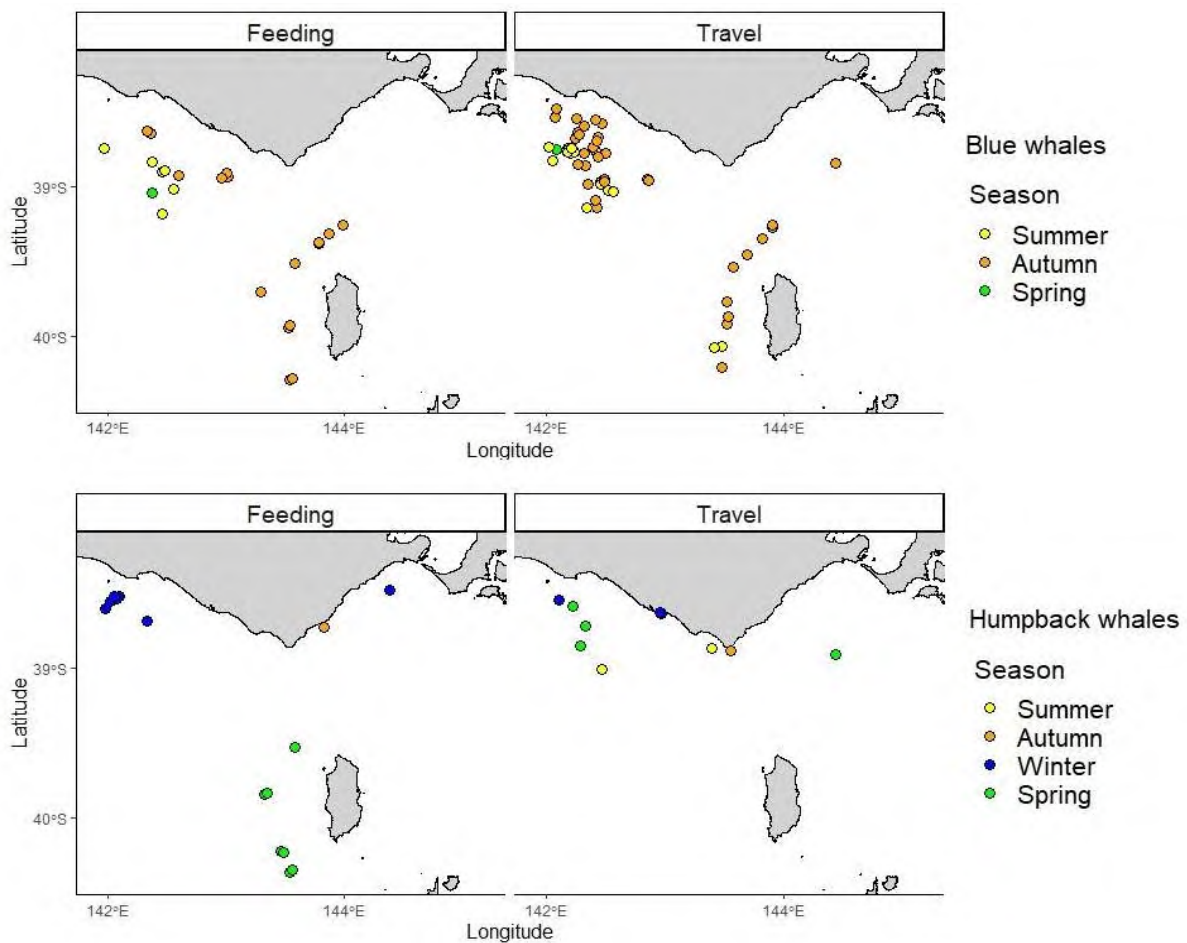


Figure 3-27 Observed behaviour at time of sighting of blue whale (top) and humpback whale (bottom) by season.

3.5. Ecophysical processes

Cetaceans are generally wide-ranging species that migrate and feed through large areas. Availability of prey is key to dictating cetacean distributions and the areas of VIC/P79 and T/49P are influenced by a range of oceanographic processes that are expected to influence productivity and the distribution of predators including cetaceans. In general, the Australian South-east Marine Region, where the survey area is located, is characterised by relative low nutrient concentration and primary productivity compared to other Australian regions (CoA, 2015). However, the mixing of water masses creates areas of high productivity and in this region, water mass structure (e.g. currents, temperature) influence the availability of nutrients and therefore productivity that leads to krill proliferation (Levings and Gill, 2002). This section describes the oceanographic context of the survey area and some of the key processes that are likely to influence cetacean distribution

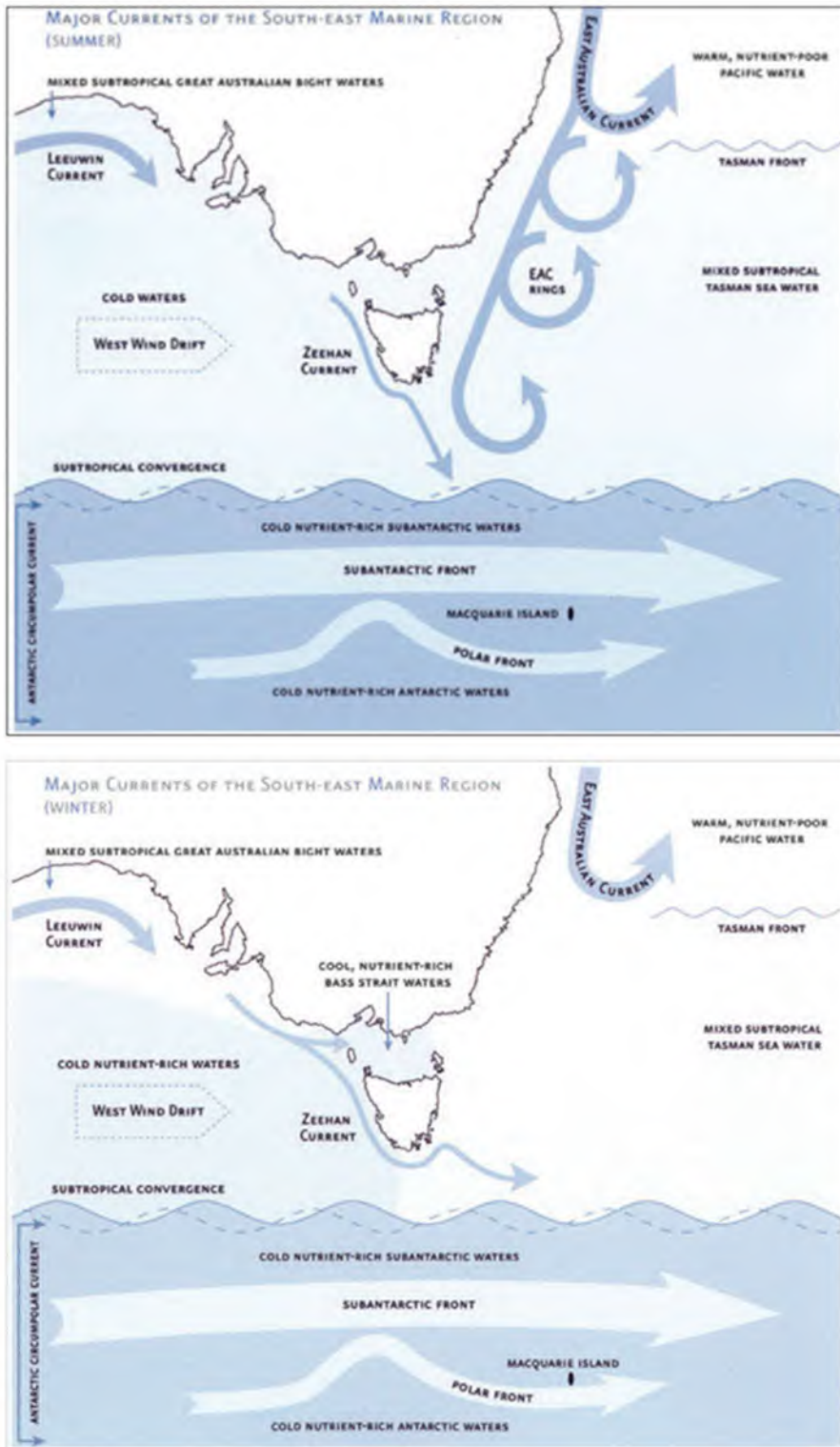
3.5.1. Oceanographic Context

The south-eastern Australian marine region is influenced by subtropical water and subpolar water, establishing an oceanographically complex area (Figure 3-28, Figure 3-29). Warm subtropical water is transported by the Leeuwin current (LC), which is originated along the Western Australia coast and is transported across the southern coast of Australia into the Great Australian Bight (GAB) (CoA, 2015). The effect of these currents over the shelf enforces geostrophic coastal currents directed to the east, which are weak in summer and strong in winter. Changes in wind speed are the key drivers of variations in sea surface anomalies and therefore influencing these coastal currents (Rogers et al., 2013).

In winter, mesoscale eddies occur in the GAB, which surface velocities may affect local upwelling and downwelling. However, these events are difficult to predict and seem to be more influential across the western GAB compared to mid and eastern GAB (Rogers et al., 2013). In winter the warm water associated with the LC extends as far as the eastern GAB and is the origin of the Zeehan current (ZC), which projects warm and saline waters down the western Tasmanian coast (interacting with the T/49P area). Compared to other currents influencing Tasmanian seasonal circulation, the ZC flow is consistent from year to year (CoA, 2015; Duran et al., 2020; Ridgway, 2007). Another major current influencing productivity in the region is the Subtropical Convergence (STC). In spring and autumn phytoplankton blooms occur in the Subtropical Convergence Zone (south of Tasmania), and in summer the region is highly productive, sustained by nutrient rich subantarctic waters (CoA, 2015).

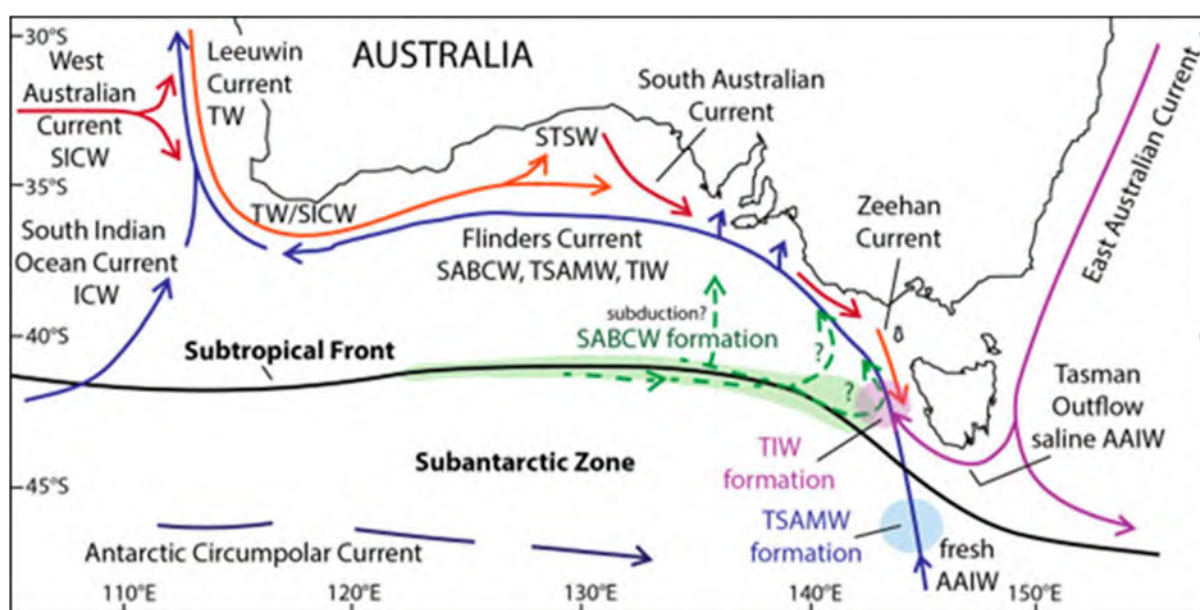
Underlying the ZC and LC is the deep Flinders Current (FC) that flows generally northwest (Figure 3-29), counter to surface currents (Middleton and Bye, 2007). The FC has been identified as the source of upwelled water in the GSACUS during periods of persistent south-easterly winds in summer to autumn (Richardson et al., 2020).

By comparison, Bass Strait is characterised by shallow water, slow easterly flow of tidal currents and a large anticlockwise circulation. Shallow water rapidly warms in summer and cools in winter compared to the surrounding region (CoA, 2015).



Source: Commonwealth of Australia, 2015.

Figure 3-28 Major currents of the South-east Marine Region in winter (top) and summer (bottom).



Source: van Ruth et al 2014

Figure 3-29 Major currents and water mass paths in the southern Australian region (Richardson 2015).

3.5.2. Processes Influencing Cetacean Distributions

The extensive Great Southern Australian Coastal Upwelling System (GSACUS) is known to provide foraging grounds for pygmy blue whales (Möller et al., 2020). The Bonney Upwelling is one key feature of the GSACUS but other upwellings and mesoscale oceanographic processes associated with the Zeehan Current (ZC), Flinders Current (FC), and the Subtropical Convergence (STC) are expected to contribute to productivity in the areas of VIC/P79 and T/49P. While VIC/P79 may be most influenced by shelf-associated features, T/49P is likely to be influenced by an upwelling feature off northwest Tasmania (Möller et al., 2020; Kämpf, 2015) that generate plankton blooms (Kämpf, 2015) and is part of the GSACUS.

On the west coast of Tasmania from October to March, a broad depression in sea surface height is generated, developing some weak southward flow during summer. The depression then shows a clear westward propagation, beginning in March. In April the weakening of the EAC along the eastern Tasmanian coast, produces cross-shelf gradients, generating a water flow towards southeast Tasmania. Overall, in the southern Australian waters, there is a positive anomaly along the entire coastal boundary from eastern Australia to Cape Leeuwin in the west. By late Autumn and early winter, the pattern is inverted, and a poleward current is evident from western Victoria towards south Tasmania. In the following months the pattern breaks up into a system of smaller eddies, the Tasmanian west coast flow represents the ZC, which peaks in June and July and persists until September. Through August and September, the coastal sea level shows a reduction of the cross-shelf gradient, and in October a depression in sea surface height is developed. As a consequence, off western Tasmania, an increase in the water flowing towards northwest is observed. This water flow represents the surface expression of the FC, a year-round upwelling-favourable current flowing from east to west along Australia's southern shelves, that occurs between October and April. During summer, the effect of the wind generates a larger FC, that directly opposes the southward flow of the ZC along the western Tasmanian slope (Ridgway, 2007).

The water masses movements described are evident in the sea surface temperature (SST) and sea surface level anomalies (SLA) recorded during the survey period (winter 2022-autumn 2023). SST and SLA data show that ConocoPhillips Australia survey area is located in an area that experienced strong gradients of sea surface temperature (Figure 3-30) and sea surface height (Figure 3-31) across the survey period. Relative sea surface temperature can indicate zones of upwelling and relative sea surface height can indicate the location of fronts and water mass boundaries that may indicate regions of enhanced productivity.

Depression in sea surface height occurred off the western Tasmanian coast between September 2022 and February 2023, corresponding to an area of lower sea surface temperature compared to the surrounding region and indicative of cold water eddies in the region. These may originate from the Flinders Current, eastward flows from the GAB or the Subtropical Convergence, and frontal zones associated with these eddies may be a role in influencing productivity in the region of T/49P. As described by Ridgway (2007), a predictable positive sea level anomaly occurred in April 2023 along the entire coastal region (Figure 3-31).

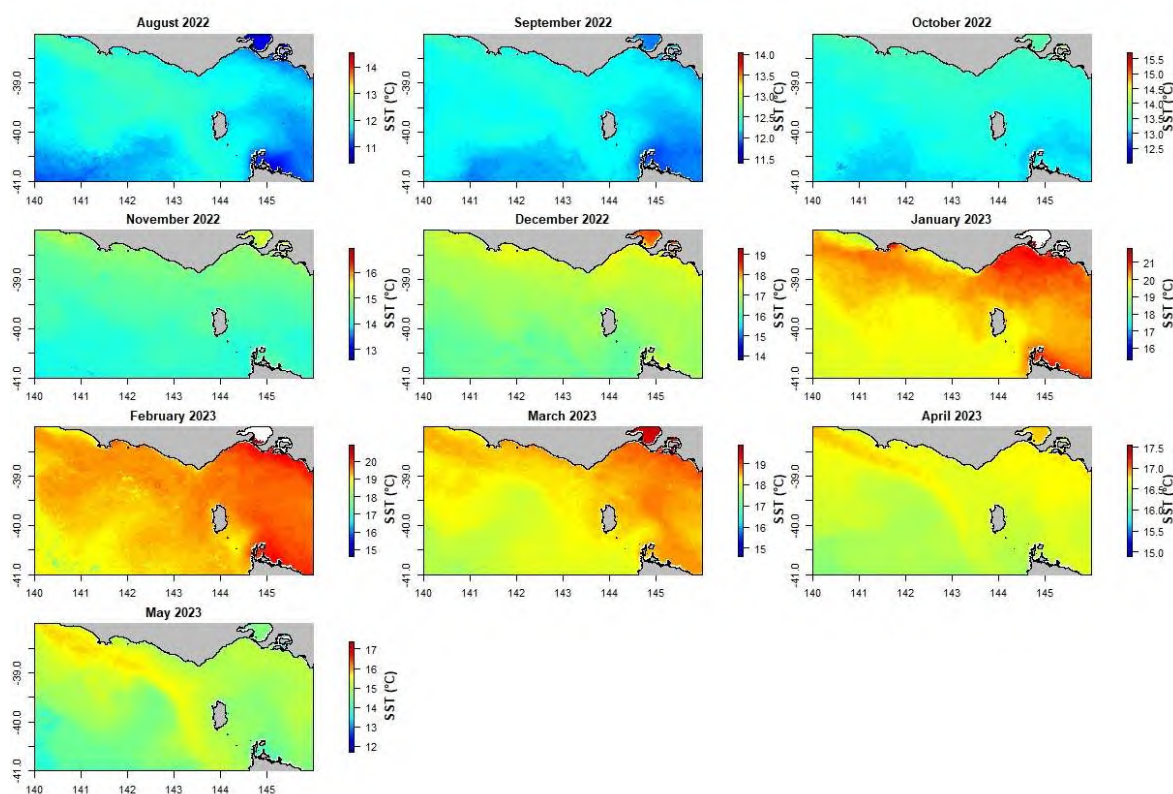


Figure 3-30 Monthly sea surface temperature recorded during the survey period. Note different colour scales. Data source Australian Ocean Data Network (AODN) portal.

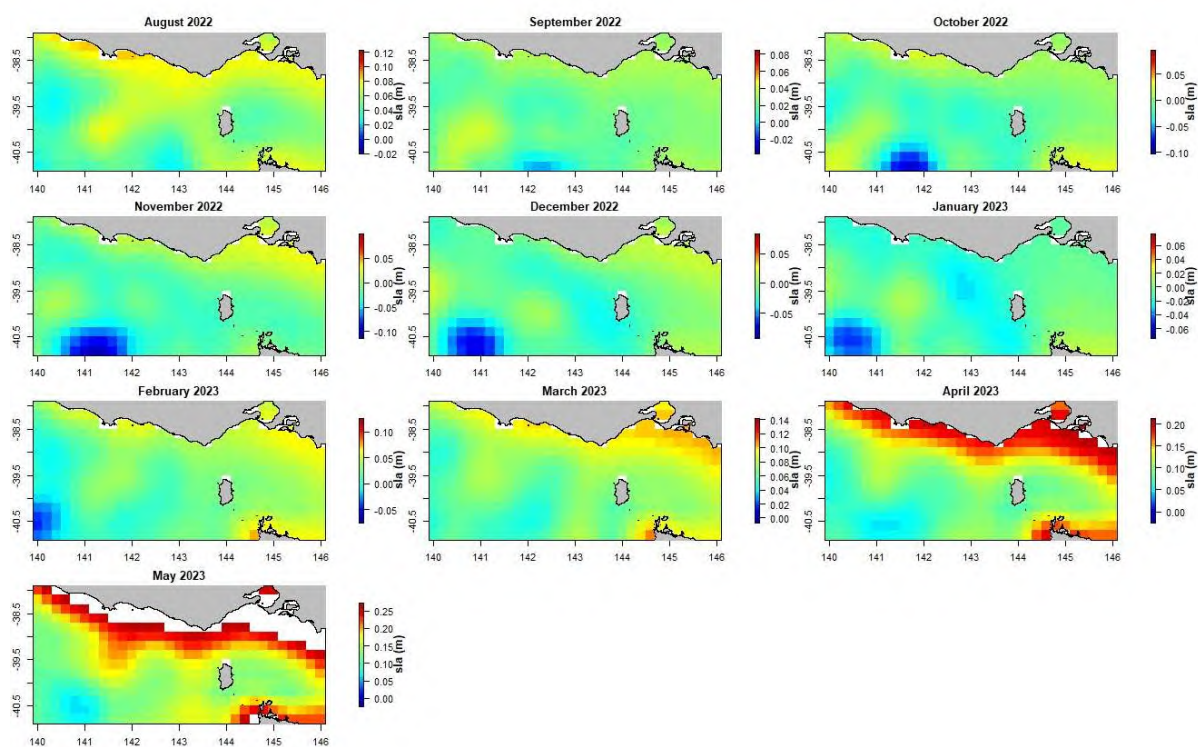


Figure 3-31 Monthly mean sea level anomaly recorded during the survey period. Note zonal boundaries of depressed sea surface height. Data source AODN portal.

Seasonal upwellings are largely forced by winds and are associated with ocean currents. The GSACUS is active during autumn and summer, driving simultaneous upwelling along the Bonney and Otway Coasts (Levings and Gill, 2010). Cool upwelled water from depths of 200-400 m is nutrient rich, enhances subsequent upwelling events and leads to phytoplankton growth in the region (Rogers et al., 2013). The GSACUS is a key and unique ecological feature of south-eastern Australian waters, it is a persistent seasonal feature, induced by lower mean wind speeds when compared to other major upwelling regions worldwide (Nieblas et al., 2009).

In the eastern GAB, primary productivity is generally higher during the summer–autumn upwelling season. Summer–autumn upwelling season is highly dependent on wind strength and direction variation. During the upwelling season, in the eastern GAB the chlorophyll maxima occur at or below the thermocline. Highest phytoplankton abundances were reported in this season and were associated with the upwelled water mass (Rogers et al., 2013). Clear peaks in chlorophyll concentration occur in autumn and spring in the south-eastern Australian marine region, with the spring peak being large than the autumn peak. The phytoplankton community appears to be distinct from other Australian waters, where upwelling produces a species succession from small to large diatoms and large dinoflagellates (Condie and Dunn, 2006). Diatoms included *Chaetoceros*, *Coscinodiscus*, *Guinardia*, *Leptocylindrus*, *Navicula*, *Pseudonitzschia*, *Skeletonema*, *Thalassiosira*, and *Thalassionema*, which commonly dominate coastal phytoplankton communities in Australian waters (Rogers et al., 2013).

T/49P is located to the northwest of Tasmania. The oceanography of this area is more complex and likely to be influenced by the interaction of the ZC, the FC and western Tasmanian seasonal coastal sea level changes, as well as upwelling associated with the GSACUS. Kämpf (2014, 2015) analysed more than a decade of satellite ocean-colour data and identified two distinct nutrient supplies in the region, one source being wind-driven coastal upwelling and the other

source depending on river plumes. During the summer, the west Tasmanian shelf forms part of the GSACUS, which appears to inject nutrient-rich water into western Bass Strait. This study provided evidence that the west Tasmanian shelf supports ten times more phytoplankton-productivity than the Bonney Coast Upwelling. Phytoplankton blooms originate through river discharges, occurring during the off-upwelling-season, may explain the winter spawning aggregations of the blue grenadier (*Macruronus novaezelandiae*) and the associated high abundance of Australian fur seals (*Arctocephalus pusillus doriferus*) (Kämpf, 2014, 2015).

The complexity of these oceanographic processes demonstrates that across both petroleum titles peaks in productivity occur, supported by upwelling events. High productivity areas are known hotspot of biodiversity, supporting multi-species assemblages, which includes large seasonal aggregations of cetaceans. Temporal and spatial distribution of cetaceans described in this report are likely to be associated with the occurrence of these events.

4. Data products

Data products detailing all sighting records including re-sights of southern right whales from the project have been produced and exported as required and supplied to ConocoPhillips Australia, the Department of Environment and Climate Change Action, Victoria, the Department of Natural Resources and Environment, Tasmania and the Department of Climate Change, Energy, the Environment and Water, Australia, on request.

4.1. CetaMAPS repository

The Cetacean Mapping and Adaptive Planning System (CetaMAPS) is a Fathom Pacific spatial relational database initiative used to map cetacean observations by land, sea and air. The system is used to securely house client data and to produce data exports as required. The system has a strict QAQC procedure that ensures a high level of confidence in the data.

4.2. Victorian State Government outputs

As part of the stakeholder engagement and collaborative approach by ConocoPhillips Australia the Victorian State Government was identified as key stakeholder and regulator in the region. As a result, all cetacean observation data was exported from ConocoPhillips Australia's CetaMAPS data holdings for use by the Victorian State Government. This export totalled 1597 validated sighting records of cetaceans accompanied by individual identification imagery of southern right whales for inclusion in the Victorian State Government operated, WhaleFace database.

4.3. Tasmanian State Government outputs

During the course of this program of works, Fathom Pacific were tasked with liaising with the Tasmanian State Government. This involved regular reporting of notable sighting events such as large feeding aggregations in or near to Tasmanian State waters and reporting of pelagic species on the continental shelf. This reporting was typically via phone conversation but also included short email reports accompanied by imagery.

4.4. Commonwealth Government outputs

As a condition of Fathom Pacific's Australian Commonwealth Marine Parks permit, Fathom Pacific were required to supply an annual permit activities report (Appendix 3) to the Commonwealth government. This report included a table of sightings with information on date, time, location and species. Also included in this report was a brief summary and a map of sighting locations. A secondary requirement of the permit was to upload all data to the OBIS AU database. These data entries may be viewed at: [Aerial surveys of cetaceans in the Zeehan and Apollo Australian Marine Parks, Australia \(2021-2022\) - Ocean Biodiversity Information System \(obis.org\)](#)

5. Conclusions

Twelve species of cetaceans were identified to species level in aerial survey transects. Blue whales observed in VIC/P79 and T/49P are likely to be part of the Indo-Australian pygmy blue whale population (CoA 2015). This population is thought to feed and move through the western Victorian region, through South Australian waters to Western Australia and into the Indian Ocean. However, subspecies determination from visual surveys must be viewed with caution.

Observations of blue whales feeding in the Otway region are consistent with the delineation of a BIAs in the Blue Whale Conservation Management Plan (CoA 2015). Blue whales were observed throughout the survey area with no consistent spatial trend other than commonly co-occurring with large surface krill swarms. Extensive areas of dense surface krill swarms were recorded across the survey area with only some being utilised by blue whales. Observations of body condition indicated some blue whales to be in poor to moderate body condition early in the season, with marked improvements observed as the season progressed.

The timing of the onset and duration of blue whale presence in the region differed from historical surveys and may be attributed to increased survey effort, inter-seasonal variations and climate variability and change which may cause distribution and migratory timing changes in a population (CoA 2015).

Humpback whales migrate and feed through the petroleum titles and the findings of this study support an emerging understanding of humpback migration pathways through western and central Bass Strait, potentially to join the east coast Australia north-south migration corridor.

Based on the low survey effort over deep water habitat and regularity of sperm whale sightings, combined with known dive times, it appears that this species may be in relatively high abundance in the continental slope waters. However, due to the lack of survey effort on this species in this region there are no historical data available which may be used for comparison to the results of this current study.

There is temporal overlap in the presence of a number of migratory species e.g., humpback, southern right and blue whales, in the region. While southern right and humpback whale migrations are somewhat predictable, and there is a seasonal signal in blue whale occurrence, complex oceanographic process and sporadic events have the potential to trigger episodic enhancements in productivity that can attract whales. The GSACUS is likely to represent a key driver of productivity enhancement throughout this region, and episodic events associated with the dynamics of the Zeehan Current, Flinders Current, and the Subtropical Convergence likely influence prey distribution and thus cetacean presence.

Overall, the findings of this study support previous findings that VIC/P79 and T/49P are in Biologically Important Areas for whale species of conservation significance. Mitigating risks of noise impacts to whales in these areas will require a blend of optimising timing of operations in relation to seasonally predictable components and adaptive management measures to respond to surveillance observations for a range of cetacean species.

6. Acknowledgements

Fathom Pacific would like to acknowledge the assistance provided by Bairnsdale Air Charter and its team of expert pilots in the execution of these surveys. We would also like to acknowledge the involvement of past fulltime and current casual employees of Fathom Pacific: Kimberley de la Motte, Alex Fejer, Leanne Nguyen, Ella Hutchinson and Claudia Hartmeier. Additionally, we must express our gratitude to the citizen science community of coastal Victoria, who generously provided real time information on large whale movements along the Victorian coast over the course of this program of works. Finally, we would like to thank Dr. Peter Gill of The Blue Whale Study for his expert review of this report.

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APPENDIX 1: AERIAL SURVEY SIGHTINGS DATASHEET

Aerial Survey Sightings Datasheet

Date: _____ Page: _____
 Client name: _____ Project Name: _____ Project Code: _____

Time hh:mm	Species	Calf (Y/N)	Behaviour	Angle	Comment	Wpt. no.	Cue	Best no.	Side (P/S)	Sighting no.	Transect name	Photos (P/S)

Species codes

Southern right whale	SRW	Sei whale	SW	Pilot whale	PW	Unidentified large whale	ULW
Humpback whale	HB	Bryde's whale	EW	False killer whale	FKW	Unidentified small whale	USW
Blue whale	BW	Minke whale	MW	Beaked whale	ZS	Unidentified toothed whale	UTW
Pygmy blue whale	PBW	Sperm whale	SPW	Unidentified rorqual	UR	Unidentified small cetacean	USC
Fin whale	FW	Killer whale	KW	Unidentified baleen	UB		

Behaviours

Bottlenose dolphin	BND	Travel	T	Logging	L
Common dolphin	CD	Slow travel	ST	Socialising	S
Risso's dolphin	RD	Fast travel	FT	Spy hop	SH
Unidentified dolphin	UD	Feeding	F	Surface active	SA
Fur seal sp.	FS	Milling	M	Sailing	SAIL
		Behavioural response			BR

Datasheet entered into CetaMAPS BY: _____ ON: _____

APPENDIX 2: AERIAL SURVEY EFFORT DATASHEET

Aerial Survey Effort Datasheet

Date: _____ Page: _____
 Client name: _____ Project Name: _____ Project Code: _____
 Observer port: _____ Observer starboard: _____ Data recorder: _____
 Pilot: _____ Aircraft model/registration: _____

Transect name	Time start hh:mm	Time end hh:mm	BSS	Wind speed (knots)	Wind Dir.	Cloud okta	Glare		Rain/haze etc.	General vis. 1=none 2=poor 3=fair 4=good	Comment
							P	S			

Datasheet entered into CetaMAPS BY: _____ ON: _____

APPENDIX 2: COMMONWEALTH MARINE PARKS REPORT

Commercial Research – Cetacean surveys from a fixed-wing aircraft

Zeehan and Apollo Marine Parks

Permit number 2021-00089-1

Report to the Department of Environment 2022

David Donnelly and Kimberley de la Motte, Fathom Pacific

Summary

This program of works was completed between 8 August and 29 December 2022. During this time, a total of eight flights that passed within the boundaries of the Zeehan and Apollo Marine Parks were completed. Transect lines were flown at a speed of 130 knots and a minimum altitude of 300 metres. Only highly experienced cetacean observers were used in primary observer roles, with lesser experienced observers onboard as data recorders. Each flight had a minimum of two primary observers, one data recorder and one pilot. Orbiting of cetaceans was minimal and always above 300 metres’ altitude.

In total, 15 cetacean detections were made within the two park boundaries (Figure 1) which involved three confirmed cetacean species: common dolphin (*Delphinus delphis*), humpback whale (*Megaptera novaeangliae* (Figure 2)) and sei whale (*Balaenoptera borealis* (Figure 3)) (Table 1). To ensure the highest confidence in sighting records, species identification information passed through a rigorous, three-step QAQC process involving expert taxonomists as required. Only after this process was completed were sighting records added to the project database.

The addition of the sei whale sighting information contained within this report, whilst small, is significant and adds new information on a species which remains poorly understood in Australian Commonwealth waters.

No incidents or accidents occurred during the field season.

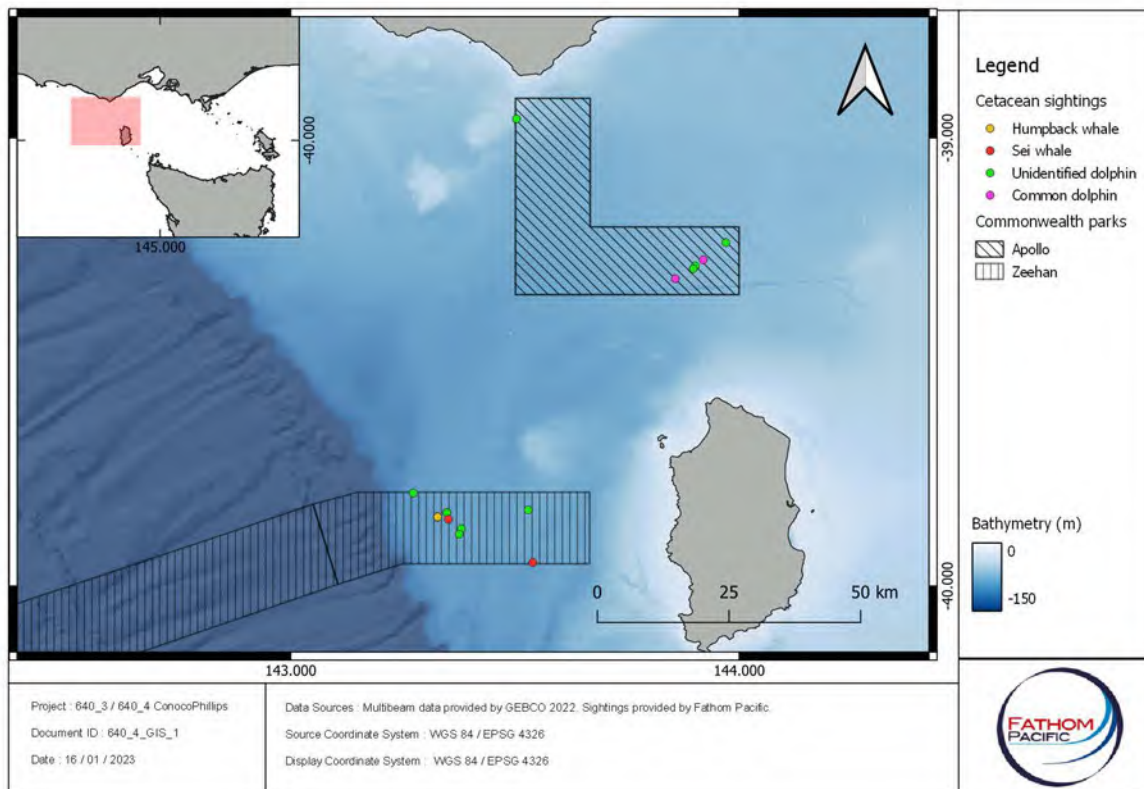


Figure 1. Cetacean sightings within Commonwealth Marine Parks



Figure 2. Humpback whales (*Megaptera novaeangliae*).



Figure 3. Sei whale (*Balaenoptera borealis*).

Table 1 Record of sightings

Date	Time	Latitude deg. dec.	Longitude deg. dec.	No. of animals	Scientific name
13/09/2022	13:45:00	-38.957	143.504	4	Unidentified dolphin
2/10/2022	14:29:00	-39.845	143.328	4	<i>Megaptera novaeangliae</i>
2/10/2022	14:32:00	-39.836	143.348	1	<i>Megaptera novaeangliae</i>
2/10/2022	14:32:00	-39.836	143.348	5	Unidentified dolphin
2/10/2022	14:33:00	-39.850	143.352	1	<i>Balaenoptera borealis</i>
2/10/2022	14:37:00	-39.872	143.380	2	Unidentified dolphin
2/10/2022	14:37:00	-39.884	143.376	7	Unidentified dolphin
2/10/2022	15:17:00	-39.947	143.540	1	<i>Balaenoptera borealis</i>
2/10/2022	15:42:00	-39.286	143.902	12	Unidentified dolphin
19/10/22	14:21:00	-39.292	143.898	8	Unidentified dolphin
19/10/22	14:23:00	-39.234	143.970	3	Unidentified dolphin
17/11/22	13:30:00	-39.792	143.273	20	Unidentified dolphin
17/11/22	14:20:00	-39.314	143.858	20	<i>Delphinus delphis</i>
2/12/22	14:41:00	-39.830	143.530	15	Unidentified dolphin
2/12/22	15:01:00	-39.272	143.920	8	<i>Delphinus delphis</i>

APPENDIX Q OPERATIONAL AND SCIENTIFIC MONITORING
PROGRAM (OSMP)



Australia Business Unit

Operational and Scientific Monitoring Program

ABU2-000-EN-R01-D-00006

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Revision Detail

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Operational and Scientific Monitoring Program

List of abbreviations

Term	Definition
AMP	Australian Marine Park
CoC	Chain of Custody
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DEECA (VIC),	Department of Energy, Environment and Climate Action
DNP	Director of National Parks
DNRE (TAS)	Department of Natural Resources and Environment
DPR	Daily Progress Report
EMT	Emergency Management Team
EP	Environment Plan
IMT	Incident Management Team
LOWC	Loss of well control
MDO	Marine diesel oil
OMP	Operational Monitoring Plan
OPEP	Oil Pollution Emergency Plan
OSMP	Operational and Scientific Monitoring Program
OSTM	Oil Spill Trajectory Modelling
PEPR	Post-survey Environmental Performance Report
PM	Program Manager
QA	Quality Assurance
QC	Quality Control
SMP	Scientific Monitoring Plan

Units of measurement

Term	Definition
km	kilometre
m	metre
M	Million

FIRST STRIKE INSTRUCTIONS

INSTRUCTIONS FOR IMMEDIATE ACTIONS FOLLOWING A LEVEL 2 or 3 SPILL:

ConocoPhillips Australia must activate OM01 (Hydrocarbon and other chemical spill trajectory prediction) **within 2 hours of a level 2 or 3 spill**, via their oil spill modelling service provider (RPS duty officer: 1300 424 115, email: osmp.response@rpsgroup.com.au), and refer to OM01 for information that will be required. Activation of OM01 may be before the Control Agency has taken over operational control.

- The **designated ConocoPhillips Australia authority** (ConocoPhillips Australia OSMP Program Manager, Incident Management Team Environmental Unit Lead) **to contact OSMP Service Provider (RPS) Program Manager to activate the OSMP** following a level 2 or 3 spill, **within 2 hours of the initial report** of the spill incident.

Service Provider	Program Manager*	Contact details	Status
RPS OSMP Response	Multiple**	1300 424 1151 Email: osmp.response@rpsgroup.com.au	Public
█	█	█ █ █	█
█	█	█ █ █	█

*During periods of leave/absence contact details for alternative on-call program manager(s) will be provided.

** RPS OSMP Response 1300 number has been newly initiated and tested. The number sends messages to multiple RPS OSMP Program Managers simultaneously. In the event this number does not connect directly to an RPS Program Manager, please call █ or █ directly.

- When initially contacting the service provider Program Manager, provide the following information:
 - The nature and scale of the spill
 - location
 - when the incident took place
 - details of the hydrocarbon released (type and estimated release volume)
 - OMPs/SMPs that must be activated (OM01 and as directed by the Control Agency)
 - Other relevant situational awareness information.
- Part A of this Operational and Scientific Monitoring Program (OSMP) provides operational direction for activating and implementing an OSMP response for hydrocarbon release related to the Otway Exploration Drilling Program.
- Part B provides useful supporting information for reference during implementation and ongoing response.

Contact details for relevant State and Commonwealth agencies relevant to an oil spill response can be found in the Otway Exploration Drilling Program Oil Pollution Emergency Plan (OPEP).

PART A – Operational Response

1. Background

ConocoPhillips Australia SH1 Pty Ltd and ConocoPhillips Australia SH2 Pty Ltd (ConocoPhillips Australia) is planning to undertake an exploration drilling campaign (up to 6 wells over 5 years) in Permits T/49P and VIC/P79, in Commonwealth waters. The timing of drilling has not been confirmed. The closest points of the operational areas to coastal locations are:

- 27 km to the west of King Island, for T/49P, and
- 6 km to the south of the Victorian coast, at the closest point, for VIC/P79.

Water depths in the operational area range from 35 m to 620 m, with the majority of the operational areas being in water depths of approximately 100 m. (Figure 1 1).

As part of the Offshore Petroleum Greenhouse Gas Storage (OPGGs) (Environment) Regulations (Environment Regulations) 2023 and various State regulations, titleholders are required to have an accepted Environment Plan (EP) to undertake offshore petroleum activities. The implementation strategy of the EP must contain an Oil Pollution Emergency Plan (OPEP) that includes adequate arrangements for responding to and monitoring oil pollution. The implementation strategy in the EP must also provide for monitoring of impacts to the environment from oil pollution and response activities that is:

- Appropriate to the nature and scale of the risk of environmental impacts for the activity, and
- Sufficient to inform any remediation activities.
- This Operational and Scientific Monitoring Program (OSMP) is intended to:
 - Provide critical information on situational awareness to support key decision-making processes as described within the Otway Exploration Drilling OPEP
 - Identify potential impacts from the spill and/or response to inform ongoing development of the scientific monitoring survey design, and
 - Provide quantitative data on impacts to sensitive receptors from the spill and subsequent recovery.

The OPEP and this OSMP have been developed to ensure timely implementation of response measures in the event of a vessel based Marine Diesel Oil (MDO) spill or a Gas Condensate (GC) spill as a result of a loss of well control (LOWC) during the Otway Exploration Drilling Program.

1.1. Purpose

The purpose of this document is to ensure that a sustainable operational and scientific monitoring response can be rapidly enacted, that is appropriate to the nature and scale of a hydrocarbon release. This OSMP is intended to guide:

- Preparedness activities
- Activation of Operational Monitoring Plans (OMP)/Scientific Monitoring Plans (SMPs) when triggered
- Management of initial mobilisation of the OSMP response
- Integration of the operational and scientific response scopes
- Managing the transition from response phase monitoring (during the period of active oil spill response, under direction from Control Agencies/IMTs under emergency response conditions) to ongoing, post-response monitoring (scientific monitoring only), and
- Finalisation and close-out.

Operational and Scientific Monitoring Program

1.2. Scope

The OSMP supports a scalable and reactive response as risk levels change throughout a marine oil pollution emergency, with activation triggers for individual operational and scientific monitoring programs used to make sure that the response is commensurate to the nature and scale of the spill. This provides a consistency of approach (which facilitates preparedness and implementation) while allowing:

- Consideration of additional ecological, socio-economic and cultural receptors
- Incorporation of emerging and novel technologies to optimise survey approaches
- Adaptation to the changing situation during a spill
- Improvement in data quality and increased data density, and
- For reduction in Health, Safety and Environment (HSE) risks.

The geographical extent used in the planning of the OSMP has been based on the extent of the predicted environment that may be affected (EMBA) by a worst-case LOWC event for the drilling campaign. The extent of the EMBA is based on the modelled fate and trajectory of the spilled hydrocarbons, exposure thresholds for selected receptors, above which potential impacts may occur.

1.3. Objectives and Key Components

The overarching objectives of this OSMP are to:

- Define the spatial extent of the oil spill, quantifying likely zones of exposure based on repeated measured hydrocarbons quantities in the marine environment over time
- Identify potential impacts of spill response activities
- Determine the spatial extent, level and duration of spill and associated response impacts to environmental and socio-economic receptors
- Determine the recovery of receptors, and
- Provide recommendations and lessons learned as outcomes from the spill response and operational and scientific monitoring, to support industry-wide improvements in spill and monitoring response.

The OSMP provides critical information following a hydrocarbon release through an integrated series of studies, comprising three main components as described below.

1.3.1. Operational (Type I) Monitoring

Operational (Type I) monitoring, or 'response phase' monitoring, is undertaken during the response phase to provide critical situational awareness information about the spill and response activities to support adaptive spill response. Due to the requirement for rapid provision of information, operational monitoring data is typically more qualitative than scientific monitoring data.

The objectives of operational monitoring are to:

- Provide data to inform the assessment of the efficacy and impacts of spill response activities.
- Provide information to define the evolving spatial extent of the spill, and identify sensitive receptor locations at risk.
- To identify locations/sensitive receptors that show indications of some level of potential impact.
- Provide information required to determine which scientific monitoring scopes have been triggered; and
- Provide information to support survey design of scientific monitoring, including potential locations for post-release pre-exposure baseline data collection.

Operational monitoring plan OM01 – Hydrocarbon and other chemical spill trajectory prediction, must be activated within 4 hours of the spill. In State jurisdiction ConocoPhillips Australia would typically implement OM01 before the Control Agency has taken over full operational control of the incident. ConocoPhillips Australia will implement, assist with, or contribute to (including funding if required) any operational monitoring as directed by the Control Agency.

Operational and Scientific Monitoring Program

1.3.2. Scientific (Type II) Monitoring

Scientific (Type II) monitoring, or 'recovery phase' monitoring, is undertaken during the response phase to determine the magnitude of impacts from the spill and response activities in the short-term, and to monitor recovery over the long-term to a high level of scientific robustness. The objectives of scientific monitoring are to:

- Determine spatial extent, severity and persistence of impacts to sensitive environmental, socio-economic receptors from the spill.
- Quantify and assess potential persistence of exposure of specific sensitive receptors to hydrocarbons.
- Quantify short- and long-term impacts and recovery.
- Allow consideration of temporal variability (e.g., seasonal and inter-annual variability).
- Allow consideration of spatial heterogeneity ('patchiness').
- Investigate likely causes and cause-effect pathways.
- Quantify and characterise recovery of sensitive receptors following termination of spill response phase, and
- Support post-release pre-exposure baseline data collection.

Scientific monitoring data may also be used to support remediation planning and will be used to determine whether ConocoPhillips Australia has met its environmental protection objectives (environmental performance outcomes as defined in the EP for the Otway Exploration Drilling activity).

If scientific monitoring is triggered, a detailed monitoring plan will be developed for each study triggered in line with the OSMP. ConocoPhillips Australia's OSMP service provider, RPS, will design and implement the appropriate scientific monitoring plans as outlined in this OSMP, in consultation with the ConocoPhillips OSMP Program Manager, who will ensure continuity and efficiency of the ongoing response.

1.3.3. Post-release, Pre-exposure Baseline Data Collection

Post-release, pre-exposure baseline data collection is implemented during and after the spill response phase. It is a reactive component of scientific monitoring to collect available pre-exposure baseline information applying scientific monitoring methods and principles. It is considered a critical consideration component for 'first-strike' application of scientific monitoring.

Reactive post-release pre-exposure monitoring, particularly in priority areas identified by Oil Spill Trajectory Modelling (OSTM) modelling, can be useful in supplementing existing baseline data to provide a more current view of the state of the environment. OSTM results will support the determination of locations where there is sufficient time to obtain reactive baseline data, considering the operational readiness of monitoring teams.

1.4. Operational and Scientific Monitoring Plans

In the event of a Level 2 or Level 3 spill (refer to the OPEP for definitions), a maximum of six operational and nine scientific monitoring plans relevant to a LOWC or vessel release will be activated. The actual number will be dependent on the nature and scale of the release, and if the pre-defined activation criteria are triggered. The target values and sensitivities (target receptors) of individual monitoring plans are defined in the plans and summarised in Table 1-1.

The operational and scientific monitoring plans provide a framework for the development of final survey documents (e.g., Sampling and Analysis Plans, Project Execution Plans, HSE documentation) and have been designed to provide sufficient information for implementation planning and preparedness. The final survey documents will be prepared following a hydrocarbon release once the nature and scale of the release is known.

Operational and Scientific Monitoring Program

Table 1-1: Operational and scientific monitoring plans

Plan No.	Title	Target Receptors	Secondary Monitoring Impacts	Monitoring Parameters	Responsible
Operational Monitoring					
OM01	Hydrocarbon and other chemical spill trajectory prediction	N/A	N/A	N/A	AMOSC / RPS 24/7 OSTM support service
OM02	Hydrocarbon and other chemical spill surveillance and reconnaissance	Multiple receptors at local- to regional-level scales	Vessel and aviation impacts to megafauna	Megafauna incidents Incidents of altered behaviour	AMOSC
OM03	Operational monitoring of hydrocarbon and other chemical properties, behaviours and weathering	Coastal and offshore pelagic habitats (i.e. water column)	Vessel impacts to megafauna	Megafauna incidents'	RPS
OM04	Pre-emptive assessment of sensitive receptors at risk	Intertidal, coastal and offshore sensitive receptors	Vessel impacts to megafauna	Megafauna incidents	RPS / COPA
OM05	Operational monitoring of contaminated sensitive receptors	Intertidal, coastal and offshore sensitive receptors	Vessel impacts to megafauna Native vegetation impacts Cultural heritage impacts Coastal habitat disruption Shorebird habitat disturbance	Megafauna incidents Native vegetation damage Altered access routes to shoreline Disturbance to supratidal areas Disturbance to, or abandonment of nesting areas Dead/injured birds (non-oiled) Damage to nests and young	SCAT – AMOSC Baseline - RPS
OM06	Air Quality Modelling (Responder Health and Safety)	Modelling of hazardous zones, vapour plumes and air quality near the oil spill release site for occupational, health and safety (OH&S) purposes	NA	NA	RPS 24/7 OSTM support services
Scientific Monitoring					
SM01	Monitoring of hydrocarbons and other chemicals in marine waters	Nearshore (coastal), offshore and deep-water pelagic zone. Includes sampling for dispersants, control agents and breakdown products	Vessel impacts to megafauna	Megafauna incidents	RPS

Operational and Scientific Monitoring Program

Plan No.	Title	Target Receptors	Secondary Monitoring Impacts	Monitoring Parameters	Responsible
SM02	Monitoring of hydrocarbons and other chemicals in benthic sediments	Nearshore (coastal), offshore and deep water marine benthic sediments and infaunal assemblages	Vessel impacts to marine benthic sediments and infaunal assemblages	Marine benthic sediments and infaunal assemblages incidents	RPS
SM03	Survey of shoreline and intertidal sediments and biological communities to determine impact of hydrocarbon / chemical spill and recovery	Environments that are subject to daily periods of tidal immersion. Examples include beaches, rocky shores, mud flats/samphire, emergent reefs and shoals, mangroves, and saltmarshes	Vessel impacts to megafauna Native vegetation impacts Cultural heritage impacts Coastal habitat disruption Shorebird habitat disturbance	Megafauna incidents Native vegetation damage Altered access routes to shoreline Disturbance to supratidal areas Disturbance to, or abandonment of nesting areas Dead/injured birds (non-oiled) Damage to nests and young	RPS
SM04	Monitoring of subtidal benthos to determine impact of hydrocarbon/ chemical spill and recovery	Nearshore (coastal), offshore and deep water subtidal benthic habitats (e.g. seagrass, kelp forests, reefs, sponge beds) and benthic species	Vessel impacts to subtidal benthic habitats and benthic species	Marine benthic sediments and infaunal assemblages incidents	RPS
SM05	Wildlife surveys to determine impact of hydrocarbon / chemical spill on shorebirds and seabirds	Seabird and shorebird colonies and populations, migratory sea/shorebirds, penguin colonies and populations	Vessel impacts to shorebirds and seabirds Coastal habitat disruption Shorebird habitat disturbance	Shorebirds and seabirds incidents Disturbance to, or abandonment of nesting areas Dead/injured birds (non-oiled) Damage to nests and young	RPS
SM06	Wildlife surveys to determine impact of hydrocarbon / chemical spill on marine megafauna	Cetaceans, pinnipeds, sharks/rays and reptiles (e.g. turtles, sea snakes)	Vessel impacts to megafauna	Megafauna incidents	RPS
SM07	Determination of impact of hydrocarbon / chemical spill on commercial, traditional and recreational fisheries (and aquaculture)	Commercial fisheries, traditional fisheries, recreational fisheries, aquaculture operations, aquaculture resource areas	Vessel impacts to commercial, traditional and recreational fisheries and aquaculture. Disruptions to commercial, traditional and recreational fisheries and aquaculture	Commercial, traditional and recreational fisheries and aquaculture operations incidents Disturbance to commercial, traditional and recreational fisheries and aquaculture operations	RPS

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Plan No.	Title	Target Receptors	Secondary Monitoring Impacts	Monitoring Parameters	Responsible
SM08	Determination of impact of hydrocarbon / chemical spill on recreational, commercial and/or industrial users	Recreational, commercial and industrial areas (includes tourism and research areas)	Vessel impacts to recreational, commercial and/or industrial users Disruptions to recreational, commercial and/or industrial users	Recreational, commercial and/or industrial users incidents Disturbance to recreational, commercial and/or industrial users	RPS
SM09	Determination of impact of hydrocarbon / chemical spill on conservation, heritage or native title	Recreational, tourism, conservation, heritage or native title importance	Vessel impacts to heritage and native title importance areas	Heritage and native title importance areas incidents	RPS

1.5. Key Learnings from Previous Spill Response Activities

When preparing operational and scientific monitoring programs, it is important to consider and, where relevant, incorporate lessons learnt from previous spills in Australian waters and elsewhere. How these are incorporated will depend on the nature of the activity, the nature of the hydrocarbon and the spill scenario.

1.5.1. Montara, 2009 (PTTEP)

The Report of the Montara Commission of Inquiry (Commonwealth of Australia 2010) identified a series of issues with OSMP response, and recommended titleholders undertake greater preparedness for future incidents including:

- Improved integration is needed between operational and scientific aspects of spill monitoring
- Scientific monitoring should be adequate, peer-reviewed and timely, with adaptable 'off the shelf' OSMPs in place to facilitate rapid mobilisation
- The National Plan should include provision for recovery of scientific monitoring costs from the titleholder (the 'polluter pays' approach) so implementation of scientific monitoring is not dependent on titleholder's cooperation and willingness to pay, and
- The environmental impacts from Montara are unlikely to ever be known as the Montara monitoring plan was not in place until 49 days into the response (Commonwealth of Australia 2010).

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) have developed an information paper (NOPSEMA 2020) to address Recommendations 90, 95 and 96 of the Montara Commission of Inquiry (Commonwealth of Australia 2010). The guidance document highlights the following challenges:

- Mobilisation timeframes of scientific monitoring (to ensure that the response is in place in time to capture the environmental impacts of a release)
- Identifying impacts that might take some time to be detectable
- Impacts are likely to occur at different locations across the response area
- The spill may result hard-to-detect indirect/long-term chronic impacts
- There may be a paucity of reliable baseline data
- Determination of the transport, fate and impacts of dispersed oil
- The scientific robustness of scientific monitoring designs
- The efficacy of monitoring program triggers (for implementation and termination)
- Adequate consideration of the vastness/remoteness of offshore areas
- Adequate consideration of environmental values and sensitivities, including global importance and season/inter-annual variability

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- Adequate consideration of the EPBC Act (including Matters of National Environmental Significance (MNES)), management of the Commonwealth Marine Area, relevant management plans (including those for Commonwealth Marine Reserves), bioregional planning documents, relevant management plans/arrangements and Australian IUCN reserve management principles
- The Montara OSMP response also highlighted that an ‘off the shelf’ OSMP must not only consider (first strike) implementation, but also maintenance of a response over a prolonged period
- Not only how to collect the samples, but also the management, transfer and analysis, and
- Contingency requirements to support an evolving situation.

These challenges have been considered in the development of the OSMP. However, this list must be consulted in the event of mobilisation as many aspects are relevant to the operational phase, rather than the preparedness phase.

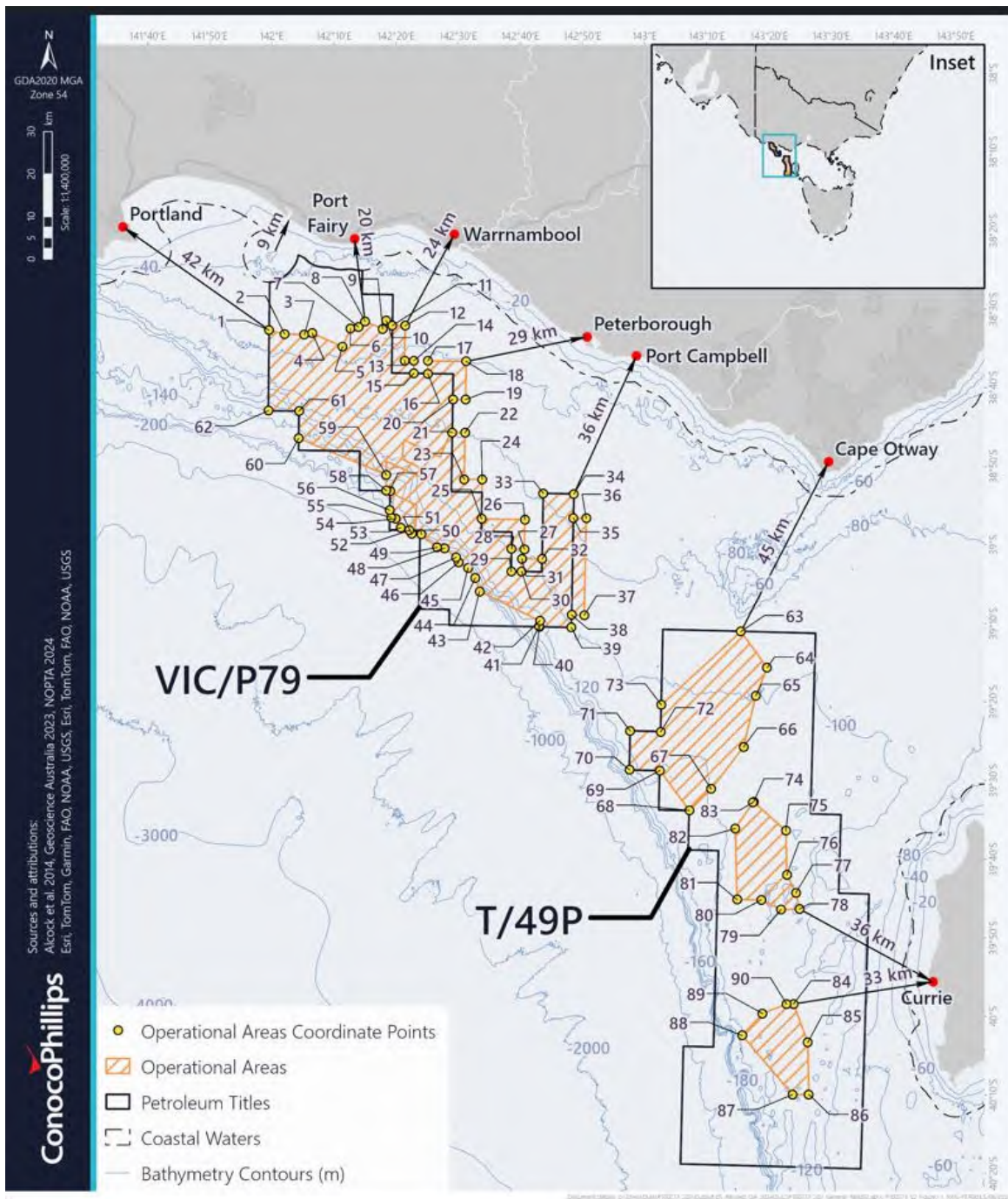


Figure 1-1: Location of Otway Operational Areas

2. Preparedness

The aim of this Plan is to demonstrate the preparedness, resources, capability, activation and mobilisation of an OSMP response in the event of a spill, as far as reasonably practicable. For preparedness purposes, the scale of the OSMP response has been based on the most credible spill scenarios and outcomes, however, this will need to be revised to reflect the actual situation in the event of a spill. The following information will be considered in revising the OSMP in the event of a spill:

- Information on the nature, scale and location of the hydrocarbon release
- Additional situational awareness information that may be available
- Sensitive receptor locations that have been or are predicted to be exposed to released hydrocarbons
- Ports of mobilisation
- Availability of suitable vessels/aircraft
- Environmental/weather conditions in the area of the incident
- OMPs and SMPs triggered
- Available baseline data/information (including information on seasonal patterns)
- Health and safety considerations, and
- Control Agency and key stakeholder concerns and/or requirements.

2.1. Resource Requirements and Capability

Table 2-1 shows the resources and capability required to assist the IMT in the coordination and management of this OSMP, and to implement the OSMP. All staff in this capability will be required to work 2/2-week rosters (daylight hours only) to provide coverage. Numbers of people/teams indicated is the total required for both swings and is therefore the minimum numbers of personnel required.

Initial response personnel will be required to report to the IMT (or designated response site) within 48 hours of being notified of an event.

Training and experience requirements for key OSMP roles are defined in Table 9-1.

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Table 2-1: Operational and Scientific Monitoring Plans resource requirements and capability

No.	Title	Summary of Required Personnel / Resourcing	Resourcing Arrangements	Timeframes
Operational Monitoring				
OM01	Hydrocarbon and other chemical spill trajectory prediction	<p>ConocoPhillips Australia has an existing agreement in place with AMOSC and RPS to allow rapid marine hydrocarbon and other chemical spill modelling capability to be activated at any time during activities. This includes access to:</p> <ul style="list-style-type: none"> Oil Spill Trajectory Modelling (OSTM) (direct from RPS or from RPS via AMOSC contract) Oil fate prediction modelling (ADIOS via AMOSC) Satellite Buoy Tracking Data (via AMOSC) 	<p>AMOSC Participating Member Contract</p> <p>RPS OSTM support contract</p>	<p>24 hours (AMOSC, RPS)</p>
OM02	Hydrocarbon and other chemical spill surveillance and reconnaissance	<p>Within 24 hours ConocoPhillips Australia has access to an existing arrangement in place with AMOSC to provide rapid spill surveillance and reconnaissance any time during activities. This includes access to:</p> <ul style="list-style-type: none"> Aerial surveillance with trained Aerial Observers (via AMOSC) Vessel surveillance (via AMOSC or RPS) Access to Satellite imagery data (from KSAT via AMOSC) <p>Note: Operational surveillance to be undertaken in accordance with OM04.</p>	<p>AMOSC Participating Member Contract</p> <p>RPS OSMP support contract</p> <p>Arrangements with Helicopter service providers</p>	<p>24 hours (AMOSC, RPS)</p> <p>Aircraft within 48 hours</p>
OM03	Operational monitoring of hydrocarbon and other chemical properties, behaviours and weathering	<p>To determine the physical and chemical properties of hydrocarbon. The monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> 1 x Technical Lead 1 x Field lead marine scientist 1 x Marine scientist Vessel personnel (for towing fluorometry unit) <p>The RPS team will have access to hydrocarbon Fluorometer, YSI sonde multi-probe with refined fuels sensor and fDOM sensor for coastal monitoring, or interface meters.</p> <p>Note: Operational surveillance to be undertaken in accordance with OM02. Additional assessment teams should be mobilised as required during the response.</p> <p>Additional water quality analysis equipment may be sourced from a NATA accredited analytical laboratory service provider if required.</p>	<p>RPS OSMP support contract</p> <p>Marine Labour Hire</p> <p>NATA accredited analytical laboratory service provider (e.g., ALS)</p>	<p>24 hours (RPS)</p> <p>Vessels within 24-48 hours of mobilisation</p>

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No.	Title	Summary of Required Personnel / Resourcing	Resourcing Arrangements	Timeframes
OM04	Pre-emptive assessment of sensitive receptors at risk	<p>Desktop assessment only - which can be completed by IMT supported by RPS staff. A minimum of at least 1 x Technical Lead will be required.</p> <p>Additional assessment personnel can be accessed via the IMT if assistance is required.</p>	RPS OSTM and OSMP support contracts	24 hours (RPS)
OM05	Operational monitoring of contaminated sensitive receptors	<p>An onshore SCAT team comprises 1 x oil spill response specialist and 1 x wildlife specialist. Dedicated SCAT teams are complemented by shoreline clean-up teams, where the team leads will be capable of completing the SCAT assessments.</p> <p>The longest shoreline undergoing active clean-up is 206 km. There will be up to 35 cleanup teams in the first 14 days (and 72 within 28 days) which can be expected to cover ~2 km of SCAT assessment per team. This results in a residual maximum of 136 km to be covered by the SCAT teams.</p> <p>SCAT teams will use drone technology and work alongside the aerial surveillance unit to prioritise sectors to visit. Visiting areas of likely shoreline accumulation every 4 days is appropriate given the focus will be on shorelines with diminishingly lower levels of contamination (i.e. the clean-up teams would be deployed to the sites of highest contamination).</p> <p>In addition to the shoreline cleanup teams, 4 SCAT teams are expected to be able to routinely cover the residual maximum sector length (136 km), with each team covering ~33 km of coastline over a 4-day period, or assessment of ~8.25 km per day.</p> <hr/> <p>Assessment of the resourcing needs has identified a potential for 2 x offshore teams to be required during the first 4 weeks of the spill response.</p> <p>Each monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> • 1 x Field Lead Scientist • 1 x Support Scientist • Marine Fauna Observer • Vessel personnel <p>Note: Operational surveillance to be undertaken in accordance with OM04.</p> <p>Samples to be sent to a NATA accredited analytical laboratory service provider if required.</p> <p>Additional MFOs can be accessed via Fathom Pacific if required.</p> <p>Additional shoreline responders can be accessed via AMSA if required.</p>	<p>RPS OSMP support contract</p> <p>AMOSOC Participating Member Contract</p> <p>Marine Fauna Aerial Surveillance Contract (MFOs)</p> <p>Marine Labour Hire (vessels)</p> <p>NATA accredited analytical laboratory service provider (e.g., ALS)</p> <p>MoU for access to National Plan resources through AMSA</p>	<p>24 hours (RPS, Aerial MFO Contract)</p> <p>48 hours (AMOSOC – support)</p> <p>Vessels within 24-48 hours of mobilisation</p> <p>Laboratory Analysis Report issued within 3 weeks from sample arrival.</p>

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No.	Title	Summary of Required Personnel / Resourcing	Resourcing Arrangements	Timeframes
OM06	Air Quality Modelling (Responder Health and Safety)	Immediate and ongoing access to air quality/plume modelling capability via RPS 24/7 service provisions.	RPS OSTM support contract	24 hours (RPS)
Scientific Monitoring				
SM01	Monitoring of hydrocarbons and other chemicals in marine waters	<p>Assessment of the resourcing needs has identified a potential for 1 x team to be required during the first 4 weeks of the spill response.</p> <p>The monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead • 1 x Lead Scientist • 1 x Support Scientist • 1 x Marine Fauna Observer • Vessel personnel <p>Samples to be sent to a NATA accredited analytical laboratory service provider.</p> <p>Additional MFOs can be accessed via Aerial MFO contract if required.</p> <p>Additional assessment teams should be mobilised as required during the response.</p>	<p>RPS OSMP support contract</p> <p>Marine Fauna Aerial Surveillance (MFOs)</p> <p>Marine Labour Hire (vessels)</p> <p>NATA accredited analytical laboratory service provider (e.g., ALS)</p>	<p>24 hours (RPS, Aerial MFO Contract)</p> <p>Vessels within 24-48 hours of mobilisation</p> <p>Laboratory Analysis Report issued within 3 weeks from sample arrival.</p>
SM02	Monitoring of hydrocarbons and other chemicals in benthic sediments	<p>Assessment of the resourcing needs has identified a potential for 1 x team to be required during the first 4 weeks of the spill response.</p> <p>The monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead • 1 x Lead Scientist • 1 x BRUV Technician • 1 x ROV Technician • 1 x Marine Fauna Observer • Vessel personnel <p>Additional MFOs can be accessed via aerial MFO contract if required.</p> <p>Samples to be sent to a NATA accredited analytical laboratory service provider.</p> <p>Additional assessment teams should be mobilised as required during the response.</p>	<p>RPS OSMP support contract</p> <p>BRUV subcontractor (via RPS)</p> <p>ROV subcontractor (e.g., Oceaneering, TMT)</p> <p>Aerial MFO contract (MFOs)</p> <p>Marine Labour Hire (vessels)</p> <p>NATA accredited analytical laboratory service provider (e.g., ALS)</p>	<p>24 hours (RPS, Aerial MFO contract)</p> <p>48 hours (ROV subcontractor)</p> <p>Vessels within 24-48 hours of mobilisation</p> <p>Laboratory Analysis Report issued within 3 weeks from sample arrival.</p>

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No.	Title	Summary of Required Personnel / Resourcing	Resourcing Arrangements	Timeframes
SM03	Survey of shoreline and intertidal sediments and biological communities to determine impact of hydrocarbon / chemical spill and recovery	<p>Assessment of the resourcing needs has identified a potential for 1 x team to be required during the first 4 weeks of the spill response.</p> <p>The monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead • 1 x Field Lead Scientist • 1 x Supporting Scientist <p>Additional assessment teams should be mobilised, e.g. using OSRL as required during the response.</p>	RPS OSMP support contract	24 hours (RPS)
SM04	Monitoring of subtidal benthos to determine impact of hydrocarbon/ chemical spill and recovery	<p>Assessment of the resourcing needs has identified a potential for 2 x teams to be required during the first 4 weeks of the spill response.</p> <p>Each monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead (can be the lead for both teams if required) • 1 x Lead Scientist • 1 x BRUV Technician • 1 x ROV Technician • 1 x Marine Fauna Observer • Vessel personnel <p>Additional MFOs can be accessed via aerial MFO contract if required.</p> <p>Additional assessment teams should be mobilised e.g. using OSRL as required during the response.</p>	<p>RPS OSTM support contract</p> <p>ROV subcontractor</p> <p>Aerial MFO contract (MFOs)</p> <p>Marine Labour Hire (vessels)</p>	<p>24 hours (RPS, Aerial MFO contract)</p> <p>48 hours (ROV subcontractor)</p> <p>Vessels within 24-48 hours of mobilisation</p>
SM05	Wildlife surveys to determine impact of hydrocarbon / chemical spill on shorebirds and seabirds	<p>SM05 Wildlife surveys will be completed by both aircraft and vessel surveillance techniques.</p> <p>Assessment of the resourcing needs has identified a potential for 1 x aerial surveillance team and up to 3 x vessel surveillance teams to be required during the first 4 weeks of the spill response.</p> <p><u>Aerial surveillance</u></p> <p>The aircraft surveillance team should initially consist of at least:</p> <ul style="list-style-type: none"> • 2 x Aerial Marine Fauna Observers • Aircraft operators <p><i>Note: the aerial MFO team will undertake SM05 and SM06 concurrently.</i></p> <p><u>Vessel surveillance</u></p>	<p>Aerial MFO contract (MFOs)</p> <p>RPS OSMP support contract</p> <p>AMOSC Participating Member Contract (Wildlife response)</p> <p>Marine Labour Hire</p> <p>Aircraft Hire (accessed via AMOSC)</p>	<p>24 hours (RPS, AMOSC, Aerial MFO contract)</p> <p>Vessels and Aircraft within 24-48 hours of mobilisation</p>

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No.	Title	Summary of Required Personnel / Resourcing	Resourcing Arrangements	Timeframes
		<p>Each vessel surveillance team will require at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead (can be the lead for all teams if required) • 1 x Field Lead Scientists • 1 x Supporting Scientists • 1 x Oiled Wildlife Responder (AMOSC) • Vessel personnel <p>Additional resources may be available via VIC DTP, TasEPA, and AMSA if required.</p> <p>Additional MFOs can be accessed via Aerial MFO contract if required.</p> <p>Additional assessment teams should be mobilised as required during the response.</p>		
<p>SM06</p>	<p>Wildlife surveys to determine impact of hydrocarbon / chemical spill on marine megafauna</p>	<p>SM06 Wildlife surveys will be completed by both aircraft and vessel surveillance techniques.</p> <p>Assessment of the resourcing needs has identified a potential for 1 x aerial surveillance team and up to 2 x vessel surveillance teams to be required during the first 4 weeks of the spill response.</p> <p><u>Aerial surveillance</u></p> <p>The aircraft surveillance team should initially consist of at least:</p> <ul style="list-style-type: none"> • 2 x Aerial Marine Fauna Observers (MFOs) • Aircraft operators <p><i>Note: the aerial MFO team will undertake SM05 and SM06 concurrently.</i></p> <p><u>Vessel surveillance</u></p> <p>Each vessel surveillance monitoring team will require at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead (can be the lead for both teams if required) • 1 x Field Lead Scientists • 1 x Supporting Scientists • 1 x Veterinarian • Vessel personnel <p>Additional MFOs can be accessed via Aerial MFO contract if required.</p> <p>Additional assessment teams should be mobilised as required during the response.</p>	<p>Aerial MFO contract (MFOs)</p> <p>RPS OSMP support contract</p> <p>Veterinarian service providers (accessed via AMOSC)</p> <p>Marine Labour Hire</p>	<p>24 hours (RPS, Aerial MFO contract, AMOSC)</p> <p>Vessels within 24-48 hours of mobilisation</p>
<p>SM07</p>	<p>Determination of impact of hydrocarbon / chemical spill on commercial,</p>	<p>Assessment of the resourcing needs has identified a potential for 2 x teams to be required during the first 4 weeks of the spill response.</p> <p>The monitoring team should initially consist of at least:</p> <ul style="list-style-type: none"> • 1 x Technical Lead 	<p>RPS OSMP support contract</p> <p>Commercial Fisher – ConocoPhillips will liaise with the Tasmanian and</p>	<p>24 hours (RPS, AMOSC)</p> <p>Sample acquired from commercial</p>

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No.	Title	Summary of Required Personnel / Resourcing	Resourcing Arrangements	Timeframes
	traditional and recreational fisheries (and aquaculture)	<ul style="list-style-type: none"> • 1 x Field Lead Scientists • 1 x Supporting Scientists (Eco-toxicologist) • 1 x Commercial Fisher • 1 x Sensory Analyst • Vessel personnel Fish toxicological samples to be sent to NATA-accredited laboratory. Additional assessment teams should be mobilised as required during the response.	Victorian Fisheries Authority, other State authorities (if required) and / or AFMA regarding sampling and analysis of commercial fish stock Sensory Analyst – (accessed via RPS/AMOSC existing contract pool) Arrangement in place with CSIRO laboratories for toxicological analysis. Marine Labour Hire	fisheries as per best endeavours CSIRO Laboratory Analysis Report issued within 3 weeks from sample arrival. Vessels within 24-48 hours of mobilisation
SM08	Determination of impact of hydrocarbon / chemical spill on recreational, commercial and/or industrial users	Assessment of the resourcing needs has identified a potential for 1 x teams to be required during the first 4 weeks of the spill response. The monitoring team should initially consist of at least: <ul style="list-style-type: none"> • 1 x Technical Lead • 1 x Supporting Scientist (if required) Additional assessment teams should be mobilised as required during the response.	RPS OSMP support contract	24 hours (RPS)
SM09	Determination of impact of hydrocarbon / chemical spill on conservation, heritage or native title	Assessment of the resourcing needs has identified a potential for 1 x teams to be required during the first 4 weeks of the spill response. The monitoring team should initially consist of at least: <ul style="list-style-type: none"> • 1 x Technical Lead • 1 x Supporting Scientist (if required) Additional assessment teams should be mobilised as required during the response.	RPS OSMP support contract	24 hours (RPS)

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2.2. Contractual Arrangements

RPS has been identified as the primary OSMP service provider and will provide trained personnel to fulfill specific OSMP capabilities as per Table 2-1.

ConocoPhillips Australia ensure that an agreed contract is in place with RPS to ensure trained personnel are available to support the OSMP throughout the life of the exploration drilling campaign. The number of OSMP roles and capability may vary over the extent of the exploration drilling program, but as a minimum the contract will include access to the capability outlined in

Table 2-2.

The total number of personnel required to implement this OSMP will be dependent on the nature and scale of the spill. However, to implement all scientific monitoring plans concurrently, a maximum of 5 x RPS OSMP Management personnel, 19 x Operational field personnel, and 62 x Scientific Monitoring personnel would be required, based on the total personnel detailed in Table 2-1. This would ensure full coverage for the initial four weeks, including a 2 week swing roster for each team, and includes trained deck crew

Any additional resources that may be required (e.g. under the direction of the Control Agency) will be facilitated by ConocoPhillips Australia. Logistical arrangements (e.g. shipping, transport, accommodation, laboratory analyses) will be either managed by ConocoPhillips Australia directly, or managed by RPS at the direction of ConocoPhillips Australia via Project Change Request forms (PCR) or via issue of additional purchase orders.

Table 2-2 outlines the contractual arrangements that will be place for the duration of the exploration program to ensure the capability required to successfully implement this OSMP can be met in the event of a spill.

Table 2-2: Contractual arrangements in place to meet the OSMP capability requirements

Primary Contractor	Arrangements
RPS	<p>RPS Group has been engaged by ConocoPhillips Australia under a Master Services Agreement. RPS have been identified as the primary OSMP service provider and will provide trained personnel to fulfill specific roles, such as:</p> <p>OSMP Management Team:</p> <ul style="list-style-type: none"> • Program Manager • Fields Operations Coordinator • Operations Support Teams • Office-based Support • HSEQ Coordinator <p>OMP and SMP field personnel:</p> <ul style="list-style-type: none"> • Technical Leads • Field Leads • Field personnel • Marine Fauna Observers • Marine Scientists • Support Scientists <p>RPS Group will also provide access to specific sub-contractors where required, including:</p> <ul style="list-style-type: none"> • BRUV subcontractor • ROV subcontractors (if required) <p><i>Note: In the event that RPS does not have the capability to resource a full OSMP response, RPS will contract subject matter expert (SMEs) from their existing resource pool to fulfil roles.</i></p>
Secondary Contractors	

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AMOSC	AMOSC has been engaged by ConocoPhillips Australia under a Master Services Agreement. AMOSC will primarily be contracted for the oil spill response resourcing (as per the OPEP) and will be responsible for undertaking response activities which align with the Operational Monitoring Plans and wildlife response as per Table 2-1.
AMSA	ConocoPhillips Australia has a MoU for access to National Plan resources through AMSA
Vessel Provider	ConocoPhillips Australia will be contracting vessel services as part of the exploration program. These service providers can be used in the event of an incident where required.
Marine Labour Hire	ConocoPhillips Australia has access to other marine labour providers if required on an as needs basis.
Aircraft service providers	ConocoPhillips Australia will be contracting helicopter and fixed wing aviation services for the exploration program, who can provide aviation services in the event of an incident.
Marine Fauna Observers (MMO)	An aerial MFO contractor will be contracted by ConocoPhillips Australia to provide trained Marine Fauna Observers (MFO) for the drilling program and can be used where required.
Remotely Operated Vehicles (ROV) service providers	ConocoPhillips Australia will have access to ROV operations providers, such as: <ul style="list-style-type: none"> • Oceaneering • Total Marine Technology (TMT)
Additional Third Party Support	
Remotely Operated Vehicles (ROV) service providers	ConocoPhillips Australia will also have access to Third Party Inspection Services that can provide ROV operations capability.
Laboratory service provider (NATA accredited)	ConocoPhillips Australia can access laboratory service providers, such as: <ul style="list-style-type: none"> • ALS (air monitoring, oil analysis, water quality, environmental monitoring) • CSIRO (fish toxicological analysis) • Intertek (analytical assessment and testing)
Fathom Pacific, The Blue Whale Study, UTAS	ConocoPhillips Australia can extend existing arrangements with a range of service providers for the provision of environmental monitoring, habitats mapping, fisheries surveys and marine mammal surveys.
OSRL	ConocoPhillips Australia can establish a OSRL Associate Member Contract if required.

2.3. Organisational Structure

The ConocoPhillips Australia IMT Incident Commander (IC) is ultimately accountable for managing response operations, which includes the OSMP.

During the spill response phase, the ConocoPhillips Australia IMT is responsible for coordinating OSMP activities, which will be led by the Environment Unit Lead (EUL) within the Planning Section of the IMT, with support from other IMT sections (e.g. Operations, Logistics, Finance). Monitoring activities in both Commonwealth and State waters will be coordinated by ConocoPhillips Australia, with direction from relevant Jurisdictional Authorities and Control Agencies.

Following the response phase, long-term scientific monitoring will be coordinated by a designated ConocoPhillips Australia's OSMP service provider, RPS, will design and implement the appropriate scientific monitoring plans as outlined in this OSMP, in consultation with the ConocoPhillips OSMP Program Manager, who will ensure continuity and efficiency of the ongoing response.

2.3.1. Key Roles and Responsibilities

Key roles and responsibilities relevant to the implementation of the OSMP are listed in Table 2-1. These roles are likely to be expanded or revised during the ongoing response.

Table 2-3: Key OSMP roles and responsibilities

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Role	Responsibility
ConocoPhillips Australia IMT Incident Commander (IC)	<ul style="list-style-type: none"> • Ultimately accountable for the implementation of the OSMP. • Ensure OSMP-specific roles are established. • Integrate operational and scientific monitoring with SOPEP/OPEP implementation. • Ensure that OMPs and SMPs are activated according to their specific trigger criteria and within response time commitments. • Ensure that the Environment Unit Lead is sufficiently resourced to oversee and guide implementation of OSMP activities.
ConocoPhillips Australia Environmental Unit Lead (EUL)	<ul style="list-style-type: none"> • The EUL is the key position for relaying information between the IMT/OSMP service provider (RPS) and may delegate an OSMP Program Manager. • Will activate OSMP Service Provider (RPS). • Reviews strategic Net Environmental Benefit Analysis (NEBA) to generate operational NEBAs. • Main point of contact and source of information between IMT/OSMP Service Provider. • Provides overarching technical advice and direction following engagement with key stakeholders (including Control Agencies and other relevant government agencies). • Disseminates data received from monitoring teams to IMT and ensures information is incorporated into Incident Action Plans (IAP) for current/next operational period. • Advises IMT on environmental impact from response activities and/or monitoring. • Coordinates communication/liaison between RPS and all other stakeholders. • Provides and/or facilitates relevant permissions and contract approvals required to implement the OSMPs. • Provides and/or facilitates support to OSMP service provider (e.g. the application of permits, provision of vessels). • Handover management of ongoing scientific monitoring components to ConocoPhillips Australia OSMP Program Manager once spill response phase has been terminated. • Liaises with Control Agencies for directions on scientific monitoring requirements. • Jointly (with Control Agencies/relevant government agencies) determines termination of OSMP activities.
ConocoPhillips Australia Situation Unit Lead (SITL)	<ul style="list-style-type: none"> • Receives data from monitoring teams and disseminates it to relevant team(s) within IMT.
ConocoPhillips Australia OSMP Program Manager/ Scientific Support Coordinator (EUL/OSMP PM)	<ul style="list-style-type: none"> • Responsible for overseeing implementation and ongoing management of OMs and SMs in accordance with this Plan. • Communicates to RPS which OM and SMs have been (or may be) triggered based on situational awareness information collected during response phase. • Supports implementation of relevant OMs and SMs. • Liaises with EUL for information/Control Agency directions on scientific monitoring requirements. • Approves sampling and analysis plans for OMs and SMs within commitment timeframe of each plan being mobilised. • Supports and ensures mobilisation of resources within commitment timeframes. • Liaises with Control Agencies, relevant stakeholders and regulators on monitoring design, priorities and results.
RPS OSMP Program Manager (RPS OSMP PM)	<ul style="list-style-type: none"> • First point of contact when an OSMP response is required. • Coordinates finalising monitoring design for activated OMs and SMs. • Response initiation contracting. • Manages RPS personnel and subcontractors. • Oversees technical management team of the RPS OSMP response. • Direct engagement with the ConocoPhillips Australia OSMP PM/EUL. • Maintenance of RPS' preparedness. • Overall responsibility for HSE of RPS field personnel and subcontractors. • Advises the OSMP PM on data collection, logistical support required, and monitoring priorities if constraints (e.g. safety, time, logistics) are encountered. • Oversees data analyses and interpretation. • Manages data, including spatial data. • Presents data in an appropriate and informative format to allow timely decisions.
RPS Technical Management Team (including Scope Technical Leads)	<ul style="list-style-type: none"> • Responsible for development of final survey designs and for ongoing technical quality of OSMP scopes. • Comprises technical leads for each OSMP scope ('scope leads'), and is managed by RPS OSMP PM. • Technical leads are responsible for several OMs or SMs under overarching technical subject categories (e.g. water quality, sediment quality, benthic habitats), in recognition of technical and logistical linkages between scopes, facilitating information transfer between scopes for an integrated response.

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Role	Responsibility
	<p><i>NOTE: It is recognised that a single organisation is unlikely to have the capacity to resource a full OSMP response (e.g. some OSMP aspects may require additional subject matter experts), and therefore scope leads may be RPS staff or contracted subject matter experts (SMEs). Roles may also be shared to allow consideration of fatigue management (e.g. periodic shift rotations of personnel) over a prolonged response period.</i></p>
RPS OSMP Field Operations Coordinator (OSMP FOC)	<ul style="list-style-type: none"> • Coordinates resources and develops a schedule of movements, in consultation with IMT/EMT Logistics Section. • Identifies locations where monitoring teams are required and resource requirements for specific locations (following engagement with technical leads). • Day-to-day responsibility for facilitating/coordinating OSMP monitoring activities. • Keeps track of vessel/aerial/shoreline movements associated with monitoring activities. • Monitors resource availability. • Direct communications with relevant scope technical leads and Field Team Leads. • Monitors and coordinate simultaneous operations.
RPS OSMP Scope Teams	<ul style="list-style-type: none"> • Scope teams include both field and office-based teams (e.g. modelling team). • A Field Team includes one Field Team Lead, who is the key contact point to the relevant technical scope lead during a field deployment. • Complies with all HSEQ directives and plans. • Assists FOC and OSMP PM as required. • Adheres to monitoring methods or identifies necessary deviations to adjust to situation. • Ensures that adequate equipment and resources are supplied to undertake the monitoring component. • Ensures awareness and understanding of QA/QC procedures. • Assists with report preparation if required.
RPS Operational Support Teams	<p>Additional roles to support day-to-day management of OSMP activities may include:</p> <ul style="list-style-type: none"> • HSE coordinator, responsible for all HSE aspects of the RPS OSMP response. • Data manager/quality lead, responsible for managing collection, distribution, QA/QC and delivery of OSMP (including laboratory) data. • Document coordinator, responsible for technical quality and delivery of OSMP documentation. • Logistics support coordinator, responsible for supporting logistical requirements of field operations. • Field party chiefs, responsible for field vessel-based operations (HSE, field operational management, communications) on a single survey vessel. • Field technical leads, responsible for technical quality of survey operations and sample/data collection in the field. • Field survey personnel, responsible for collection of data/samples under direction of field lead.
RPS Office-based Support	<p>The OSMP response will also require additional office-based personnel to support the following aspects:</p> <ul style="list-style-type: none"> • Scientific, technical and regulatory approvals • Reporting and data management, database management • Project management • Record keeping, confidentiality and archiving. • HSE • Global information systems (GIS) • Quality control • Finance/accounting • Logistics and resourcing • Legal and contracts • Schedule management • Communications • Administration and document control

2.4. Communication Protocols

The following communication protocols must be observed:

- Following activation of the OSMP service provider (RPS), initial communications will occur through the ConocoPhillips EUL/OSMP PM and OSMP Service Provider (RPS) PM for contractual, management, scientific and general direction matters
- A communication plan may be developed by ConocoPhillips Australia and RPS to provide direction on communications protocols for the ongoing response
- All OSMP operational decisions should be logged in an OSMP decision log by all ConocoPhillips Australia and RPS key personnel
- All OSMP tasks, actions and requirements should be logged in an Incident Action Plan. All correspondence between ConocoPhillips Australia and the OSMP Service Provider should be recorded and kept on file
- All communication received by the OSMP Service Provider that are not in line with these protocols should be reported to the ConocoPhillips Australia EUL/OSMP PM who will seek guidance or confirm the accuracy of the information received, and
- Unless related to safety (e.g. evacuation) any direction or instruction received by the OSMP Service Provider outside of these protocols should not be actioned without confirmation from the ConocoPhillips Australia EUL/OSMP PM

3. Activation and Mobilisation

3.1. Activation Process

Activation of the OSMP will be undertaken by ConocoPhillips Australia following a Level 2 or 3 hydrocarbon release from the Otway Exploration Drilling Program. Individual OMs or SMs will be activated where their trigger criteria have been met (refer to section 7 and 8 for trigger criteria), at the direction of the Control Agency, or at the discretion of ConocoPhillips Australia (e.g. to support situational awareness, obtain additional scientific information, or as part of compensation assessments).

Upon activation, the EUL will complete Form 1: EUL OM01 Action Checklist and Form 2: OM01 Spill Modelling Data Request.

The activation process will also be in line with the action framework (see Figure 1-2).

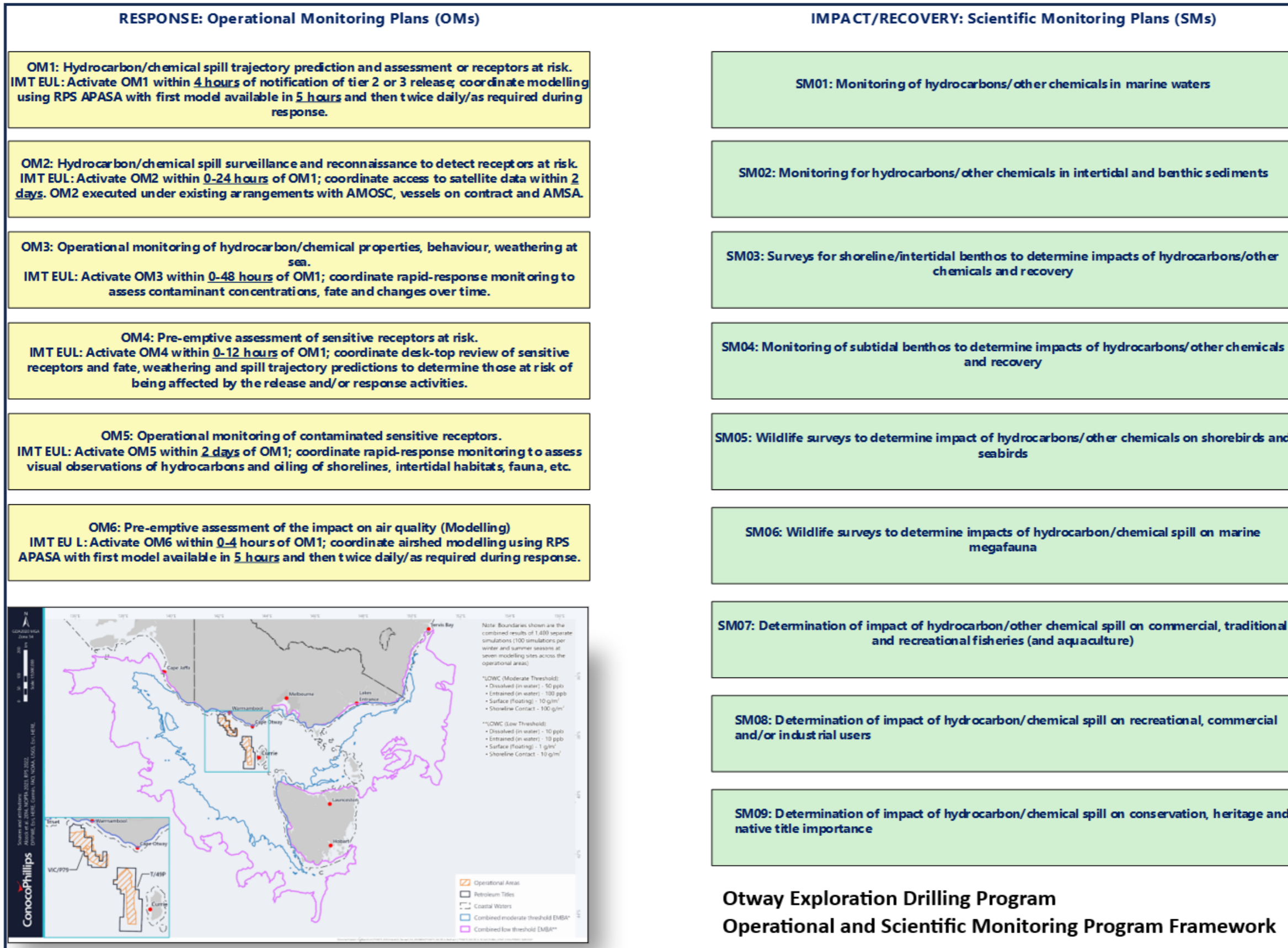


Figure 3-1: OSMP Framework

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3.1.1. Confirm Monitoring Priorities

Spill-specific monitoring priorities will be identified by Control Agencies and from consultation with key stakeholders following activation. In addition, requirements of relevant management plans (e.g. for Australian Marine Parks) will be considered in the survey design. Refer to OSMP objectives (Section 1.3) for general response priorities.

3.1.2. Finalise Monitoring Design

Key considerations for finalising the monitoring design are discussed in Section 6. Survey designs will adopt best-practice robust scientific approaches, with consideration of data analysis and interpretation. Each survey design will consider the following:

- Random sampling: a scientifically robust, objective approach although may require increased sampling effort to attain statistical robustness
- Systematic sampling: using a grid or consistent pattern to identify survey locations across a geographic area
- Authoritative or selective sampling: using expert judgement to select sampling locations (e.g. based on bathymetry or known specific features). The subjectivity in the approach can introduce bias, so it is recommended that this approach is combined for a more rigorous method
- Stratification of survey locations (based on pre-defined criteria, e.g. zone on shore, water depth, hydrocarbon exposure zones or habitat type). This approach applies a hierarchy of replication at a range of spatial scales, i.e. replicates within sites, sites within locations, locations within zones (e.g. impacted/unimpacted) to allow adequate consideration of spatial variability
- Reference location selection: locations are selected based on similarity in environmental/substrate conditions to impact sites and must be relatively unimpacted representatives of the broader area.
- These sites will be used to identify the level of impact from the spill and associated response activities.
- Multiple locations are required to allow consideration of natural spatial variability
- 'Context' locations: where feasible, locations that have been exposed to or impacted by the spill but have not been exposed to spill response strategies and tactics. This approach is used to identify the level of impact and rate of recovery from an unmitigated spill impact
- QA/QC requirements, and
- Data analysis and management.

Even when the intended design has been finalised, the approach to data collection may need to be modified in-situ depending on several factors, including:

- Information gathered from monitoring and evaluation and the OMPs
- The evolution, weathering, behaviour and extent of the spill
- Weather and sea state conditions
- Unforeseen presence of protected species at monitoring locations, and/or
- Site locations and access given unforeseen logistical and safety constraints.

Control measures will be identified to manage the impacts and risks of implementing a spill response (e.g. restrictions on disturbance of sensitive shorelines by shoreline responders etc). Benchmarking and indicator taxa or alignment with baseline sampling methods will be used where appropriate.

The level of replication required for statistical robustness may in many cases be determined using power analysis, a method commonly used to determine the power to detect change and the risk of 'false positives' (e.g. Button et al. 2013). However, power analysis is not a suitable method for determining sampling effort for all datasets (e.g. qualitative and multivariate data) and simpler methods, such as coefficients of variation, may be required for timely response. The sampling design must allow for analysis and interpretation of impacts and recovery at a range of spatial scales (local to regional).

This approach allows consideration of the change in extents of impact zones as spill hydrocarbons become less bioavailable and biological communities recover, within the context of natural variability in natural environmental conditions and ecological communities.

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Further information on recommended approaches is provided in specific OSMPs, but these are for guidance only. The final design approach will be determined by the relevant technical lead(s) once an understanding of the nature and scale of the hydrocarbon release is known.

3.1.3. Regulatory Engagement

Engagement with regulators will be the responsibility of ConocoPhillips Australia. However, under certain circumstances RPS may be required to engage directly with regulators at the request of ConocoPhillips Australia. Engagement may include:

- Liaison with DCCEEW to ensure that relevant OMs and SMs are aligned with contemporary requirements in relevant EPBC Act plans of management, including potential updates to South-East Marine Parks Network Management Plan
- Obtainment of permits
- Ongoing technical guidance on OSMP scopes
- Consideration of stakeholder requirements, and
- Document/report reviews.

3.1.4. Permits and Access Requirements

Permit and access requirements apply to Marine Parks, Marine Protected Areas, restricted heritage areas, operational areas of industrial sites, Defence locations and managed fisheries but in some cases, they may apply to all State or Commonwealth waters. Examples of jurisdictional authorities that should be considered when identifying permit requirements are provided in Table 3-1.

If permits are likely to be required in any area, at the onset of activation, the EUL or delegate will be responsible for contacting the relevant jurisdictional authority and/or asset manager and arrange for the pre-issuing of 'blanket' sampling permits to avoid the typical lead times when applying for permits through normal channels.

Should individual permits be required, and at the direction of ConocoPhillips Australia, permits and access may be applied for by the RPS office-based support team as soon as reasonably practicable following activation of OSMP scopes. Where possible, applications will be submitted before full survey details are known (with the detailed information being added before final approval).

Table 3-1: Jurisdictional authorities for key sensitive receptors

Receptor	Jurisdictional Authority
State Marine Protection Areas Fish Habitat Protection Areas	State government department with jurisdiction for parks and wildlife. State government department with jurisdiction for fisheries.
RAMSAR wetland	Commonwealth Department of Agriculture, Water and the Environment (DAWE)
Australian (Commonwealth) Marine Parks	Parks Australia
State managed fisheries	State department with jurisdiction for fisheries
Commonwealth managed fisheries	Australian Fisheries Management Authority (AFMA)
Indigenous cultural heritage	State government department with jurisdiction
Defence/restricted military area	Department of Defence
Industry (e.g. operational zone of offshore oil and gas facility)	Operating company
Shipwrecks	State or Commonwealth government department with jurisdiction for maritime cultural heritage/archaeology

3.2. Mobilisation Process

3.2.1. Mobilisation and Implementation Timeframes

The time it takes to mobilise and implement each OMP and SMP will vary according to the spill characteristics, mobilisation constraints and logistical requirements following activation. Figure 3-1 provides

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an indicative implementation schedule for OMs and SMs in the EMBA, and for the immediate surrounding waters at the spill site.

Note: 'activation' means that the OM or SM has been triggered and the IMT-EUL/Service Provider will commence finalisation of plans to implement the following actions:

Activate internal OSMP personnel and external contracts.

- Finalise the survey designs
- Finalise overall sampling strategy across scopes
- Determine suitable sampling frequency
- Finalise standard operating procedures
- Allocate number of teams, personnel, equipment and supporting resource requirements
- Finalise SAP and HSE documentation prior to mobilisation of field teams
- Confirm logistics (e.g. flights, accommodation, vessels), and
- Commence mobilisation of Field Teams.

For SMs, they will also:

- Gather existing baseline data and/or establish potential control/reference sites
- Identify potential areas for post-release pre-exposure baseline data collection
- Establish technical guidelines to be considered
- Confirm target species (where relevant), and
- Confirm parameters and metrics.

3.2.2. Personnel Transfers and Accommodation

All travel and accommodation will be managed by ConocoPhillips Australia, or alternatively through RPS' Booking Agent, where ConocoPhillips Australia directs RPS to arrange. Commercial airlines, hire car companies and taxis will be used for personnel transport requirements. Off-road OSMP operations will preferably be undertaken using rented mine-specification 4WD vehicles where available, and off-road trailers will be sourced where required. Personnel may stay on offshore survey vessels, and /or on coastal survey vessels if bunk space allows.

Personnel transfers and accommodation will be required to consider the risks of COVID-19, and therefore prevailing State or Commonwealth Covid restrictions (if any) will be considered to manage risk of interstate and international personnel resources.

3.2.3. Freight

ConocoPhillips Australia will be responsible for logistical management of freight transfers during the response phase.

Equipment freight will be managed by RPS for scientific monitoring surveys during the post-response (recovery) phase, or where otherwise requested by ConocoPhillips Australia. RPS has an existing relationship with national logistics companies. Freight can generally be ready to ship within 24 hours of being notified.

3.2.4. Provision and Victualling

Shore-based survey teams will arrange provisions for their pre-defined survey period, in line with contractual arrangements. Recommendations on provisioning and storage of provisions will be provided in HSE plans.

Survey vessels will be fully provisioned based on the maximum period at sea for the specific survey vessel and people on board (pax), up to a limit of 3 weeks per swing. Where field survey operations are expected to take longer than 3 weeks, the vessel will return to port for re-provisioning (and rotation of survey personnel as part of fatigue management).

4. Ongoing Response Phase

4.1. Resources

RPS will be responsible for maintaining operational awareness of the availability of OSMP response resources.

4.2. Scheduling

Scheduling of mobilisation and demobilisation of personnel, equipment and survey platforms (vessels, planes, etc.) will be based on fatigue management recommendations and, to a lesser extent, practical considerations including weather and site conditions, vessel endurance (the period between port visits), distance from port, accommodation capacity on vessels, sample holding times, and survey type (aerial, intertidal, coastal or offshore).

Scheduling will consider HSE risks initially based on expected risk levels and will adapt to changes in the situation during the OSMP response. HSE assessments will consider the following:

- The type of environment
- The remoteness of the environment
- The survey activities to be undertaken (including risk levels and how arduous the activities are)
- The potential risks from fatigue and effective mitigation methods
- The effects on morale of the survey activities and location, and
- The local environmental hazards (e.g. hydrocarbon exposure, weather, tides, hazardous biota, engineering hazards, exposure to the elements).

Other considerations include the location and potential mobilisation requirements for personnel and equipment. Scheduling of rotations will be undertaken in advance to allow efficient logistical planning and management. This also allows alternative resources to be identified and engaged should they be required, in a timely manner. Prior to the end of each rotation, a hand over procedure will be developed to ensure incoming personnel are made fully aware of the current situation for consistency of ongoing programs.

Schedules should also include office-based requirements such as regular OSMP program meetings, expected data delivery dates, reporting deadlines and to cover for staff absences (due to illness or leave).

It must be remembered that during high-stress and high-demand periods (e.g. especially during the first few weeks of the response), office-based staff are also likely to become fatigued and an effective plan should be in place to manage this.

4.3. Logistics

Mobilisation and demobilisation of field teams and resources will be managed by the Planning Section of the IMT during the spill response phase. Once the response phase has been terminated ConocoPhillips Australia will continue to undertake the logistical management of mobilisation and demobilisation of field teams and resources. The ConocoPhillips Australia OSMP PM (Table 2.1) will retain their role, even once the IMT has been stood down, to provide continuity in OSMP management.

4.4. Sample Transfer and Management

Samples collected for laboratory analysis as part of OSMP field operations will be stored and transferred as per the specific instructions provided by the analytical laboratory for each sample type. Samples will be grouped for storage and transport based on holding times, storage requirements, sample type and analytical laboratory to optimise sample management and facilitate transfer of samples within holding times.

All samples submitted for analysis will be accompanied by a Chain of Custody (CoC) form, which details the laboratory the samples will be sent to, the analytical methods and the limits of detection required. The CoC form will accompany samples during transport and delivery.

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The form will be signed with the time and date recorded by each individual responsible for the samples including RPS staff and laboratory personnel. Upon each exchange, the CoC form is countersigned and duplicated by the relinquisher. The recipient retains the original. When samples are received by the laboratory, a duplicate of the original will be issued to RPS confirming arrival. The CoC allows RPS to track the samples and ensure that samples arrive at the intended destinations on schedule.

Where holding times are shorter than the survey rotation period (e.g. 7 days for water samples, with up to 3 weeks between survey personnel rotations), alternative arrangements will be made to collect samples for transfer to the laboratory. For survey teams based on the mainland, 4WD vehicles (with off-road trailers) can travel between survey teams on a rota-basis to collect samples. Nearshore coastal vessels may be able to return to a port, harbour or jetty to offload samples. Where this is not feasible, arrangements will be made for either helicopter transfer of samples, or vessel-to-vessel transfers (of samples only).

Samples will either be freighted from site/ports to laboratories or accompany demobilising survey personnel for hand-delivery to laboratories. Refrigerated transport will be required for samples. In the event the refrigerated truck is not available on the day, previous survey experience in Australia has demonstrated that ice-packed eskies will suffice to store and transport samples to the laboratory.

4.5. Data Management

RPS will be responsible for managing the receipt, QA/QC, transfer and collation (e.g. into databases) of OSMP field and laboratory data, in line with the data and metadata management plan (to be prepared in the first 48 hours following a notification of a spill). RPS will also be responsible for the continual management and implementation of OSMP metadata. Field Teams and Field Operations Coordinator will work closely to develop a schedule for the anticipated delivery of field and laboratory data. RPS will be responsible for engaging with analytical laboratories to follow up on any data delivery and quality issues and identify data format and delivery schedules to support periodic technical reporting requirements.

4.6. Daily Reporting

All field teams will prepare daily reports for transmittal to the RPS Field Operations Coordinator. The Daily Progress Reports (DPRs) will contain the following information:

- Project and scope (OSMP) reference
- Date
- Name or person completing report
- Permit number (if relevant)
- Vessel name/registration number
- Name and contact details of vessel master (where relevant)
- Location (e.g. nearest geographic location, or closest survey site reference if at sea)
- Name and contact details of Party Chief or Field Lead
- Daily HSE statistics and lessons learned
- Daily weather observations (e.g. wind and sea state)
- Daily events reported with event times
- Plans for subsequent day(s)
- List of vessel's complement - vessel crew and survey personnel

Records of loss of equipment and/or down-time related to survey equipment and vessel deployment gear shall be kept, to allow office-based support staff to identify if equipment needs replacement during the next rotation. Where internet access is unavailable, survey personnel will call the RPS office via satellite phone to provide this information. The relevant DPR will then be prepared by office support staff.

4.7. Reporting to ConocoPhillips Australia

Periodic reporting refers to reports that are required at key stages or throughout the OSMP response. Some of these reports will be prepared on a post-survey, seasonal, annual or post-response phase basis. Reporting will comprise:

- OSMP program status reports
- Field daily progress reports
- Health, safety and environment (HSE) reports
- Technical reports, and
- Post-survey Environmental Performance Reports (PEPRs).

The structure, function, composition and time frames for OSMP program status reports will be agreed between ConocoPhillips Australia and the Service Provider (RPS) as part of final agreement of the communications protocol. Indicative field day report formats are described in Section 4.6. Finalised OSMP reporting requirements (HSE reports and technical reporting requirements) will be defined in the plan-specific HSE plans and sampling and analysis plans (SAPs). These plans will include requirements for reporting delivery schedules, which will include provisions for stakeholder reporting requirements and any requirements for reviews of technical reports by an independent review panel. Technical reports will be prepared to address the stated objectives of the relevant OSMP (either in part or full, depending on the nature of the report).

5. Termination of Response

OSMPs will be terminated when plan-specific termination criteria have been met. This will be guided by the direction of relevant Control Agencies/government agencies/authorities, and considerations from key government stakeholders (where other criteria have already been met). Note that terminated OSMPs may be re-activated following a significant change in risk, via direction from a Control Agency or relevant government agencies/authority, or at the discretion of ConocoPhillips Australia (e.g. following stakeholder engagement). See Sections 7 and 8 for termination criteria for individual OMPs and SMPs.

5.1. Demobilisation and Stand-down Process

Demobilisation of operational monitoring will be managed by ConocoPhillips Australia during and following termination of the oil spill response phase. Demobilisation of scientific monitoring scopes will be managed by ConocoPhillips Australia and RPS in the post-response phase. Survey specific demobilisation requirements will be part of the project execution plan for each survey.

5.2. Reporting and Close-out

5.2.1. Data Collection and Delivery

Quality assurance and quality control data will be compiled in OSMP databases/spreadsheets throughout the OSMP response. Data collation will also include digital (scanned) copies of all field survey reports, field survey logbooks, Chain of Custody documentation (CoCs) and other records completed by hand.

RPS will ensure the compiled datasets have been checked against data records to confirm that all data (and metadata) for each scope are accounted for and will confirm details of the QA/QC assessments undertaken on the data. Any remaining data gaps will be identified and addressed, with records generated detailing the outcomes.

Once all digital data (or sets of data) have been compiled and final checks have been completed, databases will either be transferred to ConocoPhillips Australia via appropriate password-protected storage media, or (where applicable and in line with corporate data management requirements) transferred via online resources (e.g. secure websites/data portals, cloud services and/or corporate internet-based file transfer systems).

5.2.2. Analysis and Interpretation

Final datasets for individual scopes will be analysed to provide interpretation of:

- Impacts of the spill on the values or sensitivities for each plan
- Potential impacts of spill response activities
- Recovery over time, and
- Consideration of the potential effects of other natural and anthropogenic impacts.

Statistical analyses of quantitative data will be undertaken using appropriate, commonly used and scientifically robust univariate and multivariate statistical analysis techniques. Depending on the size of datasets for each scope, data analyses may be undertaken solely by RPS or in conjunction with a third-party service provider.

5.2.3. Final Reports

Report types will include some or all of the following:

- OSMP program status reports
- Field daily progress reports
- Health, safety and environment (HSE) reports
- Technical reports
- A summary report, collating the outcomes of each OSMP report, and
- A 'lessons learned' report, detailing OSMP challenges, solutions and future recommendations.

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The structure, function, composition and timeframes for OSMP program status reports will be agreed between ConocoPhillips Australia and the Service Provider (RPS) as part of final agreement of the communications protocol. Indicative field day report formats are described in Section 4.6. Finalised OSMP reporting requirements (HSE reports and technical reporting requirements) will be defined in the plan, specific HSE plans and SAPs. These plans will include requirements for reporting delivery schedules, which will include provisions for stakeholder reporting requirements and requirements for independent peer reviews of technical reports.

5.2.4. Archiving

All digital and paper records, data and reports will be archived in accordance with RPS internal archiving procedures and standards. Completion of the archiving process will be the final requirement of the operational and scientific monitoring program close-out phase. ConocoPhillips Australia will then be informed that the OSMP response has been completed.

PART B – Scientific Response

6. Survey Design

6.1. Monitoring Priorities

The environmental and socio-economic values and sensitivities known to occur within the EMBA are defined in the EP. The sensitive environmental receptors covered in this Plan, and the corresponding OMPs/SMPs, are detailed in Table 6.1.

Table 6-1: Sensitive receptors addressed in OMPs and SMPs

Receptor ¹	Summary	Relevant OMP/SMP
Primary Producers		
Marine and intertidal flora	Monitoring the extent of hydrocarbons and potential impacts to marine flora at offshore islands, reefs, shoals/banks and shoreline/intertidal habitats from the spill and response activities.	OM04, OM05, OM06, SM03, SM04
Invertebrate Communities		
Infauna, filter feeders and other sessile and mobile benthic invertebrates	Monitoring the extent of hydrocarbons and potential impacts to infauna, filter feeders and other sessile and mobile benthic invertebrates at offshore benthic and shoreline/intertidal habitats from the spill and response activities.	OM04, SM03, SM04
Offshore, Coastal and Intertidal Habitats		
Water quality	Monitoring the extent of hydrocarbons/chemicals, forecasted trajectory/ movement, fate and weathering to assess potential impacts to marine waters and intertidal and benthic sediments.	OM01, OM02, OM03, SM01
Sediment quality		OM01, OM02, - OM03, SM02
Benthic habitats	Monitoring the extent of hydrocarbons/chemicals, persistence, and potential impacts (i.e. change) to benthic habitats (such as reefs, seagrass, macroalgae, filter feeding communities, and soft sediment communities) that are attributable to the spill and response activities	OM04, SM04
Intertidal habitats	Monitoring the extent of hydrocarbons/chemicals, persistence, and potential impacts (i.e. change) to intertidal habitats (including sandy shores, rocky shores, reefs, reef flats, tidal flats, saltmarsh, creeks/rivers/wetlands) that are attributable to the spill and response activities.	OM04, OM05, SM03
Marine Fauna		
Seabirds and shorebirds	Assessment and monitoring of the presence of oiled seabirds and shorebirds and any potential impact to shoreline habitat from the hydrocarbon spill or associated spill response activities.	OM02-OM06, SM05
Marine megafauna	Assessment and monitoring of the presence of oiled marine megafauna, including marine mammals (whales and dolphins), pinnipeds, reptiles and sharks.	OM01, OM02-OM05, SM06
Socio-Economic and Cultural Heritage		
Commercial, traditional and recreational fisheries and aquaculture	Assessment and monitoring of potential impacts on fish and fishery resources to determine the spatial and temporal extent of sublethal impacts on indicator species, which may impact commercial, traditional and recreational fish species, including health effects attributable to the spill and/or response activities and tainting of the flesh and/or bioaccumulation of toxins in fish.).	OM04, OM05, OM06, SM07
Recreational, commercial and/or industrial users	Assessment of the extent, severity and likely persistence of direct and indirect impacts on commercial, recreational and/or	OM04, OM05, OM06, SM08

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Receptor ¹	Summary	Relevant OMP/SMP
	industrial users to identify areas where monitoring may need to continue for an extended period of time following termination of the response.	
Commercial shipping	The assessment and monitoring of potential impacts to these receptors will be informed by the implementation of various OMPs and SMPs as they would occur with the same spatial area as environmental receptors and would be affected through the same cause-effect pathways.	OM01-OM06, SM01-SM04, SM08, SM09
Offshore exploration and petroleum activities		
Defence activities		
European heritage, e.g. shipwrecks		
First Nations cultural heritage		

6.1.1. Priority Planning Areas

Oil spill trajectory modelling predicts exposure of various areas to spilled hydrocarbons and provides guidance of time-to-exposure and concentrations/thicknesses of hydrocarbon that the receptors will be contacted by. It supports the prioritisation of monitoring programs indicating if more sensitive receptors will be exposed (or contacted) and which receptors will be exposed first and hence where it is time-critical to collect baseline data.

High priority is afforded to sensitive receptors where there is a moderate-high probability of sea surface exposure (>10 g/m²) and/or shoreline contact (>100 g/m²), a low minimum time before contact and a moderate-high maximum shoreline loading.

Priorities for monitoring will be specific to the nature and scale of the hydrocarbon spill and will change throughout the duration of the monitoring program. Key factors for consideration when establishing monitoring priorities include:

- Tracking the spill exposure zone (operational monitoring) to validate modelling
- Water depth at sensitive receptor locations
- Presence of sensitive receptors (environmental and socio-economic values and sensitivities) at risk
- Spatial distributions of values/assets at sensitive receptor locations (if known)
- Predicted time until sensitive receptors are exposed to hydrocarbons (where available)
- Availability of baseline data and/or ability and timeframe to rapidly obtain post-spill pre-exposure data
- Availability of appropriate reference sites
- Available resources and equipment to conduct the work in terms of personnel, logistics
- Access to the sites, and
- Potential environmental risk of OSMP response activities.

NOTE: Detailed information on the spill risks and predictive modelling analysis can be found in the EP and OPEP.

Potential priorities for monitoring have been identified through analysis of stochastic modelling results against the location of key sensitive receptors with high conservation value, including habitat, species and important socio-economic/heritage values. The following tables list the high priority receptors identified by analysis of the modelling results for LOWC scenarios for VIC/P79 and T/49P, separately.

Table 6-2 presents the high-risk receptors for sea-surface oiling at low, moderate and high thresholds, where modelling indicates a high probability of contact based on the combined dataset for modelled locations in T/49P.

Table 6-3 presents the high-risk receptors for shoreline contact at low, moderate and high threshold, where modelling indicates a high probability of contact based on the combined dataset for modelled locations in T/49P.

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Tables 6-4 and 6-5 present the high-risk receptors for instantaneous exposures to dissolved and entrained hydrocarbons, respectively, where modelling indicates a high probability of contact based on the combined dataset for modelled locations in T/49P.

Table 6-2: High-risk receptors for sea-surface oiling at low, moderate and high thresholds, for T/49P

Type	Receptor	Probability of sea-surface oiling			Minimum time (days) before exposure (Moderate Threshold)
		Low (1-10 g/m ²)	Moderate (10-50 g/m ²)	High (>50 g/m ²)	
AMP	Zeehan Marine Park		High	-	0.08
BIA	Antipodean Albatross - Foraging	High	High	-	0.04
BIA	Black-browed Albatross - Foraging	High	High	-	0.04
BIA	Bullers Albatross - Foraging	High	High	-	0.04
BIA	Campbell Albatross - Foraging	High	High	-	0.04
BIA	Common Diving-petrel - Foraging	High	High	-	0.04
BIA	Indian Yellow-nosed Albatross - Foraging	High	High	-	0.04
BIA	Pygmy Blue Whale - Distribution	High	High	-	0.04
BIA	Pygmy Blue Whale - Foraging	High	High	-	0.04
BIA	Short-tailed Shearwater - Foraging	High	High	-	0.04
BIA	Shy Albatross - Foraging	High	High	-	0.04
BIA	Southern Right Whale - Connecting Habitat	Low-High	-	-	0.04
BIA	Southern Right Whale - Migration	High	High	-	0.04
BIA	Wandering Albatross - Foraging	High	High	-	0.04
BIA	Wedge-tailed Shearwater - Foraging	High	High	-	0.04
BIA	White Shark - Distribution	High	High	-	0.04
BIA	White-faced Storm-petrel - Foraging	High	High	-	0.04
EEZ	Australian Exclusive Economic Zone	High	High	Low	0.04
IMCRA	Central Bass Strait	Low-High	High	-	0.79
IMCRA	Central Victoria	Medium-High	-	-	N/A
IMCRA	Otway	High	High -	-	0.04
KEF	West Tasmania Canyons	Low-High	-	-	N/A

Table 6-3: High-risk receptors for shoreline contact at low, moderate and high thresholds, for T/49P

Type	Receptor	Probability of shoreline contact			Minimum time (days) before exposure (Moderate Threshold)
		Low (≥10 g/m ²)	Moderate (≥100 g/m ²)	High (≥1000 g/m ²)	
SHORE	King Island	Medium-High	-	-	4.04

Table 6-4: High-risk receptors for instantaneous exposures to dissolved hydrocarbons, for T/49P

Type	Receptor	Probability of Instantaneous Dissolved Contact		
		Low (≥10 ppb)	Moderate (≥50 ppb)	High (≥400 ppb)
AMP	Apollo	Low-High	Low-High	-
AMP	Beagle	Low-High	Low	-
AMP	Zeehan	Medium-high	Low-High	Low-High
BIA	Antipodean Albatross - Foraging	High	High	High
BIA	Australasian Gannet - Foraging	Low-High	Low-High	-
BIA	Black-browed Albatross - Foraging	High	High	High
BIA	Black-faced Cormorant - Foraging	High	Medium-High	Low-High
BIA	Bullers Albatross - Foraging	High	High	High
BIA	Campbell Albatross - Foraging	High	High	High
BIA	Common Diving-petrel - Foraging	High	High	High
BIA	Indian Yellow-nosed Albatross - Foraging	High	High	High
BIA	Little Penguin - Foraging	High	Medium-High	-
BIA	Pygmy Blue Whale - Distribution	High	High	High
BIA	Pygmy Blue Whale - Foraging	High	High	High
BIA	Short-tailed Shearwater - Breeding	Low-High	Low-High	-

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Type	Receptor	Probability of Instantaneous Dissolved Contact		
		Low (≥10 ppb)	Moderate (≥50 ppb)	High (≥400 ppb)
BIA	Short-tailed Shearwater - Foraging	High	High	High
BIA	Shy Albatross - Foraging	High	High	High
BIA	Southern Right Whale - Connecting Habitat	Medium-High	Low-High	-
BIA	Southern Right Whale - Migration	High	High	High
BIA	Wandering Albatross - Foraging	High	High	High
BIA	Wedge-tailed Shearwater - Foraging	High	Medium-High	Low-High
BIA	White Shark - Distribution	High	High	High
BIA	White Shark - Foraging	Medium-High	Low-High	-
BIA	White-faced Storm-petrel - Foraging	High	High	Medium-High
EEZ	Australian Exclusive Economic Zone	High	High	High
IBRA	King Island	Medium-High	Low-High	-
IMCRA	Central Bass Strait	High	High	Low-High
IMCRA	Central Victoria	Low-High	-	-
IMCRA	Flinders	Low-High	Low	-
IMCRA	Otway	High	High	High
KEF	West Tasmania Canyons	Low-High	Low-High	Low-High
RAMSAR	Lavinia	Low-High	-	-
SHORE	Black Pyramid	-	Low-High	-
SHORE	King Island	Medium-High	Low-High	-
SHORE	Reid Rock	Low-High	-	-
State Waters	Tasmania State Waters	High	Medium-High	Low-High
	Victoria State Waters	Low-High	-	Low

Table 6-5: High-risk receptors for instantaneous exposures to entrained hydrocarbons, for T/49P

Type	Receptor	Probability of Instantaneous Entrained Contact	
		Low (≥10 ppb)	High (≥100 ppb)
AMP	Apollo	Medium-High	-
AMP	Beagle	Low-High	-
AMP	Boags	Low-High	-
AMP	Franklin	Low-High	-
AMP	Zeehan	High	Low-High
BIA	Antipodean Albatross - Foraging	High	High
BIA	Australasian Gannet - Foraging	High	Low-High
BIA	Black-browed Albatross - Foraging	High	High
BIA	Black-faced Cormorant - Foraging	High	Medium-High
BIA	Bullers Albatross - Foraging	High	High
BIA	Campbell Albatross - Foraging	High	High
BIA	Common Diving-petrel - Foraging	High	High
BIA	Grey Nurse Shark - Migration	Low-High	Low
BIA	Humpback Whale - Foraging	Low-High	Low
BIA	Indian Yellow-nosed Albatross - Foraging	High	High
BIA	Little Penguin - Breeding	Low-High	-
BIA	Little Penguin - Foraging	High	Medium-High
BIA	Pygmy Blue Whale - Distribution	High	High
BIA	Pygmy Blue Whale - Foraging	High	High
BIA	Short-tailed Shearwater - Breeding	High	Low-High
BIA	Short-tailed Shearwater - Foraging	High	High
BIA	Shy Albatross - Foraging	High	High
BIA	Soft-plumaged Petrel - Foraging	Low-High	Low
BIA	Sooty Shearwater - Foraging	Low-High	-
BIA	Southern Right Whale - Connecting Habitat	High	Medium-High
BIA	Southern Right Whale - Migration	High	High
BIA	Wandering Albatross - Foraging	High	High
BIA	Wedge-tailed Shearwater - Foraging	High	High

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Type	Receptor	Probability of Instantaneous Entrained Contact	
		Low (≥10 ppb)	High (≥100 ppb)
BIA	White Shark - Breeding	Low-High	-
BIA	White Shark - Distribution	High	High
BIA	White Shark - Foraging	High	Low-High
BIA	White-faced Storm-petrel - Foraging	High	High
EEZ	Australian Exclusive Economic Zone	High	High
IBRA	East Gippsland Lowlands	Low-High	-
IBRA	Flinders	Low-High	-
IBRA	Gippsland Plain	Low-High	-
IBRA	King Island	High	Medium-High
IBRA	Otway Ranges	Low-High	Low-Medium
IBRA	Strzelecki Ranges	Low-High	-
IBRA	Wilson's Promontory	Low-High	-
IMCRA	Boags	Low-High	Low-High
IMCRA	Central Bass Strait	High	High
IMCRA	Central Victoria	Low-High	-
IMCRA	Flinders	Low-High	Low-Medium
IMCRA	Franklin	Low-High	Low-High
IMCRA	Otway	High	High
IMCRA	Twofold Shelf	Low-High	-
KEF	Upwelling East of Eden	Low-High	-
KEF	West Tasmania Canyons	Low-High	Low-High
MNP	Bunurong	Low-High	-
MNP	Point Hicks	Low-High	-
MNP	Wilson's Promontory	Low-High	-
MS	Marengo Reefs	Low-High	Low
NP	Kent Group	Low-High	-
NPS4	Wilson's Promontory Marine Park	Low-High	-
NPS4	Wilson's Promontory Marine Reserve	Low-High	-
RAMSAR	Lavinia	Low-High	Low
RSB	Bell Reef	Low-High	-
RSB	Bravenes Rock	Low-High	-
RSB	Brown Rocks	Low-High	Low
RSB	Cody Bank	Low-High	-
RSB	Cutter Rock	Low-High	-
RSB	New Zealand Star Bank	Low-High	-
SHORE	Albatross Island	Low-High	-
SHORE	Anser Island	Low-High	-
SHORE	Bass Coast	Low-High	-
SHORE	Bega Valley	Low-High	-
SHORE	Black Pyramid	Low-High	-
SHORE	Circular Head	Low-High	-
SHORE	Curtis Island	Low-High	-
SHORE	East Gippsland	Low-High	-
SHORE	Gabo Island	Low-High	-
SHORE	Glennie Group	Low-High	-
SHORE	Hogan Island Group	Low-High	-
SHORE	Hunter Island	Low-High	-
SHORE	Kanowna Island	Low-High	-
SHORE	Kent Island Group	Low-High	-
SHORE	King Island	High	Medium-High
SHORE	Moncoeur Islands	Low-High	-
SHORE	Norman Island	Low-High	-
SHORE	Pyramid Island	Low-High	-
SHORE	Reid Rock	Medium-High	Low-High
SHORE	Rodondo Island	Low-High	-
SHORE	Seal Islands	Low-High	-

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Type	Receptor	Probability of Instantaneous Entrained Contact	
		Low (≥10 ppb)	High (≥100 ppb)
SHORE	Shellback Island	Low-High	-
SHORE	Skull Rock	Low-High	Low-Medium
SHORE	South Gippsland	Low-High	-
SUB-LGA	Apollo Bay	Low-High	Low-Medium
SUB-LGA	Bega Valley	Low-High	-
SUB-LGA	Cape Howe / Mallacoota	Low-High	-
SUB-LGA	Cape Liptrap	Low-High	-
SUB-LGA	Cape Patton	Low-High	Low
SUB-LGA	Croajingolong	Low-High	-
SUB-LGA	Venus Bay	Low-High	Low
SUB-LGA	Waratah Bay	Low-High	-
SUB-LGA	Wilson's Promontory	Low-High	Low
State Waters	Tasmania State Waters	High	Medium-High
	Victoria State Waters	Low-High	-

Table 6-6 presents the high-risk receptors for sea-surface oiling at low, moderate and high threshold, where modelling indicates a high probability of contact based on the combined dataset for modelled locations in VIC/P79.

Table 6.7 presents the high-risk receptors for shoreline contact at low, moderate and high threshold, where modelling indicates a high probability of contact based on the combined dataset for modelled locations in VIC/P79.

Tables 6.8 and 6.9 present the high-risk receptors for instantaneous exposures to dissolved and entrained hydrocarbons, respectively, where modelling indicates a high probability of contact based on the combined dataset for modelled locations in VIC/P79.

Table 6-6: High-risk receptors for sea-surface oiling at low, moderate and high thresholds, for VIC/P79

Type	Receptor	Probability of sea-surface oiling			Minimum time (days) before exposure (Moderate Threshold)
		Low (1-10 g/m ²)	Moderate (10-50 g/m ²)	High (>50 g/m ²)	
BIA	Antipodean Albatross - Foraging	High	High	-	
BIA	Black-browed Albatross - Foraging	High	High	-	
BIA	Bullers Albatross - Foraging	High	High	-	
BIA	Campbell Albatross - Foraging	High	High	-	
BIA	Common Diving-petrel - Foraging	High	High	-	
BIA	Indian Yellow-nosed Albatross - Foraging	High	High	-	
BIA	Pygmy Blue Whale - Distribution	High	High	-	
BIA	Pygmy Blue Whale - Foraging	High	High	-	
BIA	Short-tailed Shearwater - Foraging	Low-High	-	-	
BIA	Shy Albatross - Foraging	High	High	-	
BIA	Southern Right Whale - Reproduction	Low-High	High	-	
BIA	Southern Right Whale - Migration	High	High	-	
BIA	Wandering Albatross - Foraging	High	High	-	
BIA	Wedge-tailed Shearwater - Foraging	High	High	-	
BIA	White Shark - Distribution	High	High	-	
BIA	White Shark - Foraging	-	High	-	
EEZ	Australian Exclusive Economic Zone	High	High	-	
IMCRA	Otway	High	High	-	0.08
KEF	West Tasmania Canyons	Low-High	-	-	2
SHORE	Colac Otway	Low-High	-	-	3.92
SHORE	Corangamite	Low-High	-	-	2.46
SHORE	Moyne	Low-High	-	-	1.46
State Waters	Victoria State Waters	Low-High	-	-	1

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Table 6-7: High-risk receptors for shoreline contact at low, moderate and high thresholds, for VIC/P79

Type	Receptor	Probability of shoreline contact			Minimum time (days) before exposure (Moderate Threshold)
		Low (1-10 g/m ²)	Moderate (10-50 g/m ²)	High (>50 g/m ²)	
SHORE	Colac Otway	Medium-High	Low-High	-	5.04
SHORE	Corangamite	Low-High	-	-	4.08
SHORE	Moyne	Low-High	Low-High	Low	3.25
SHORE	Warrnambool	Low-High	Low-High	-	3
SHORE	Lady Julia Percy Island	Low-High	Low-High	-	2.29

Table 6-8: High-risk receptors for instantaneous exposures to dissolved hydrocarbons, for VIC/P79

Type	Receptor	Probability of Instantaneous Dissolved Contact		
		Low (≥10 ppb)	Moderate (≥50 ppb)	High (≥400 ppb)
AMP	Apollo	Medium-High	Low-High	Low-High
AMP	Zeehan	Low-High	-	-
BIA	Antipodean Albatross - Foraging	High	High	High
BIA	Australasian Gannet - Foraging	Low-High	Low-High	-
BIA	Black-browed Albatross - Foraging	High	High	High
BIA	Bullers Albatross - Foraging	High	High	High
BIA	Campbell Albatross - Foraging	High	High	High
BIA	Common Diving-petrel - Foraging	High	High	High
BIA	Indian Yellow-nosed Albatross - Foraging	High	High	High
BIA	Little Penguin - Foraging	Low-High	-	-
BIA	Pygmy Blue Whale - Distribution	High	High	High
BIA	Pygmy Blue Whale - Foraging	High	High	High
BIA	Short-tailed Shearwater - Foraging	High	Medium-High	Low-High
BIA	Shy Albatross - Foraging	High	High	High
BIA	Southern Right Whale - Reproduction	Low-High	Low-High	-
BIA	Southern Right Whale - Migration	High	High	High
BIA	Wandering Albatross - Foraging	High	High	High
BIA	Wedge-tailed Shearwater - Foraging	High	High	High
BIA	White Shark - Distribution	High	High	High
BIA	White Shark - Foraging	Medium-High	Low-High	-
BIA	White-faced Storm-petrel - Foraging	Medium-High	Low-High	Low
EEZ	Australian Exclusive Economic Zone	High	High	High
IBRA	Otway Plain	Medium-High	Low-High	Low-Medium
IBRA	Otway Ranges	Medium-High	Low-High	-
IBRA	Warrnambool Plain	Low-High	Low-High	-
IMCRA	Central Bass Strait	Low-High	Low-High	-
IMCRA	Central Victoria	Medium-High	Low-High	Low-Medium
IMCRA	Otway	High	High	High
KEF	Bonney Coast Upwelling	Low-High	Low-High	-
KEF	West Tasmania Canyons	Low-High	-	-
MNP	Twelve Apostles	Low-High	Low-High	-
MS	Marengo Reefs	Low-High	Low-High	-
MS	The Arches	Low-High	-	-
RSB	Bravenes Rock	Medium-High	Low-High	-
SHORE	Colac Otway	Medium-High	Low-High	Low-Medium
SHORE	Corangamite	Low-High	Low-High	-
SHORE	Moyne	Low-High	-	-
SUB-LGA	Apollo Bay	Medium-High	Low-High	-
SUB-LGA	Bay of Islands	Low-High	-	-
SUB-LGA	Cape Otway West	Medium-High	Low-High	Low-Medium
SUB-LGA	Cape Patton	Low-High	Low-Medium	-
SUB-LGA	Childers Cove	Low-High	-	-
SUB-LGA	Moonlight Head	Low-High	Low-High	-

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Type	Receptor	Probability of Instantaneous Dissolved Contact		
		Low (≥10 ppb)	Moderate (≥50 ppb)	High (≥400 ppb)
SUB-LGA	Port Campbell	Low-High	-	-
State Waters	Victoria State Waters	High	Medium-High	Low-High

Table 6-9: High-risk receptors for instantaneous exposures to entrained hydrocarbons, for VIC/P79

Type	Receptor	Probability of Instantaneous Entrained Contact	
		Low (≥10 ppb)	High (≥100 ppb)
AMP	Apollo	High	Low-High
AMP	Beagle	Low-High	-
AMP	Zeehan	Low-High	-
BIA	Antipodean Albatross - Foraging	High	High
BIA	Australasian Gannet - Foraging	High	Low-High
BIA	Black-browed Albatross - Foraging	High	High
BIA	Black-faced Cormorant - Foraging	Low-High	-
BIA	Bullers Albatross - Foraging	High	High
BIA	Campbell Albatross - Foraging	High	High
BIA	Common Diving-petrel - Foraging	High	High
BIA	Indian Yellow-nosed Albatross - Foraging	High	High
BIA	Little Penguin - Breeding	Low-High	-
BIA	Little Penguin - Foraging	Low-High	-
BIA	Pygmy Blue Whale - Distribution	High	High
BIA	Pygmy Blue Whale - Foraging	High	High
BIA	Short-tailed Shearwater - Breeding	Low-High	-
BIA	Short-tailed Shearwater - Foraging	High	High
BIA	Shy Albatross - Foraging	High	High
BIA	Southern Right Whale - Reproduction	Medium-High	Low-High
BIA	Southern Right Whale - Connecting Habitat	Low-High	-
BIA	Southern Right Whale - Migration	High	High
BIA	Wandering Albatross - Foraging	High	High
BIA	Wedge-tailed Shearwater - Foraging	High	High
BIA	White Shark - Breeding	Low-High	-
BIA	White Shark - Distribution	High	High
BIA	White Shark - Foraging	High	Low-High
BIA	White-faced Storm-petrel - Foraging	High	Low-High
EEZ	Australian Exclusive Economic Zone	High	High
IBRA	Flinders	Low-High	-
IBRA	Gippsland Plain	Low-High	-
IBRA	King Island	Low-High	-
IBRA	Otway Plain	High	Medium-High
IBRA	Otway Ranges	High	Low-High
IBRA	Strzelecki Ranges	Low-High	-
IBRA	Warrnambool Plain	High	Low-High
IBRA	Wilsons Promontory	Low-High	-
IMCRA	Central Bass Strait	High	Low-High
IMCRA	Central Victoria	High	Low-High
IMCRA	Flinders	Low-High	-
IMCRA	Otway	High	High
IMCRA	Twofold Shelf	Low-High	-
IMCRA	Victorian Embayments	Low-High	-
KEF	Bonney Coast Upwelling	Low-High	Low-High
KEF	West Tasmania Canyons	Medium-High	Low-High
MNP	Bunurong	Low-High	-
MNP	Point Addis	Low-High	-

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Type	Receptor	Probability of Instantaneous Entrained Contact	
		Low (≥10 ppb)	High (≥100 ppb)
MNP	Twelve Apostles	Medium-High	Low-High
MNP	Wilson's Promontory	Low-High	-
MS	Marengo Reefs	Medium-High	Low-High
MS	Merri	Low-High	-
MS	Mushroom Reef	Low-High	-
MS	The Arches	Low-High	-
NPS4	Bunurong Marine Park	Low-High	-
NPS4	Wilson's Promontory Marine Park	Low-High	-
NPS4	Wilson's Promontory Marine Reserve	Low-High	-
RSB	Bravenes Rock	High	Medium-High
RSB	Cody Bank	Low-High	-
RSB	Cutter Rock	Low-High	-
SHORE	Anser Island	Low-High	-
SHORE	Bass Coast	Low-High	-
SHORE	Colac Otway	High	Medium-High
SHORE	Corangamite	High	Low-High
SHORE	Curtis Island	Low-High	-
SHORE	Glennie Group	Low-High	-
SHORE	Hogan Island Group	Low-High	-
SHORE	Kanowna Island	Low-High	-
SHORE	King Island	Low-High	-
SHORE	Lady Julia Percy Island	Low-High	-
SHORE	Moncoeur Islands	Low-High	-
SHORE	Mornington Peninsula	Low-High	-
SHORE	Moyne	Low-High	Low-High
SHORE	Norman Island	Low-High	-
SHORE	Phillip Island	Low-High	-
SHORE	Rodondo Island	Low-High	-
SHORE	Seal Islands	Low-High	-
SHORE	Shellback Island	Low-High	-
SHORE	Skull Rock	Low-High	-
SHORE	South Gippsland	Low-High	-
SHORE	Surf Coast	Low-High	-
SHORE	Warrnambool	Low-High	-
SUB-LGA	Anglesea	Low-High	-
SUB-LGA	Apollo Bay	High	Low-High
SUB-LGA	Bay of Islands	Low-High	Low-High
SUB-LGA	Cape Liptrap (NW)	Low-High	-
SUB-LGA	Cape Otway West	High	Low-High
SUB-LGA	Cape Patton	Medium-High	Low-High
SUB-LGA	Childers Cove	Low-High	Low-High
SUB-LGA	French Island / San Remo	Low-High	-
SUB-LGA	Kilcunda	Low-High	-
SUB-LGA	Lorne	Low-High	-
SUB-LGA	Moonlight Head	High	Low-High
SUB-LGA	Mornington Peninsula (S)	Low-High	-
SUB-LGA	Mornington Peninsula (SW)	Low-High	-
SUB-LGA	Port Campbell	Low-High	Low-High
SUB-LGA	Port Fairy	Low-High	-
SUB-LGA	Port Phillip (Sorrento Shore)	Low-High	-
SUB-LGA	Torquay	Low-High	-
SUB-LGA	Venus Bay	Low-High	-
SUB-LGA	Waratah Bay	Low-High	-
SUB-LGA	Warrnambool	Low-High	-
SUB-LGA	Westernport	Low-High	-
SUB-LGA	Wilson's Promontory (East)	Low-High	-

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Type	Receptor	Probability of Instantaneous Entrained Contact	
		Low (≥10 ppb)	High (≥100 ppb)
SUB-LGA	Wilsons Promontory (West)	Low-High	-
State Waters	Tasmania State Waters	Low-High	-
	Victoria State Waters	High	High

In addition to these locations, there are receptors that are transient (i.e. cetaceans, pinnipeds, seabirds) and others, such as managed fisheries, with large spatial and temporal extents. Assumed species presence is based on existing BIAs identified in the tables above and should be considered in development of any scientific monitoring programs. These receptors are described in detail in the activity-specific EP and OPEP. ConocoPhillips Australia will work with RPS to include these receptors in its finalised monitoring design at the time of the spill to ensure current information on their location is used. Other biota likely to be present within the survey area and/or spill EMBA include, but are not limited to:

- Benthic assemblages (including sponges, hydrozoans, bryozoans, annelids, molluscs, echinoderms and crustaceans including the commercially important Southern Rock Lobster (SRL) and Giant Crab (GC)).
- Phytoplankton and zooplankton (which include critical lifecycle stages, such as eggs and juvenile dispersal/settling stages) of Southern Rock Lobster (SRL) and Giant Crab (GC).
- Marine flora (e.g. macroalgae, seagrasses).
- Fish (over 500 species for fish and sharks including 15 listed as threatened, four as migratory, 29 Syngnathiforms and many commercially important species).
- Cephalopods (giant squid, Gould’s squid, octopus).
- Cetaceans (minke, Antarctic minke, sei, Bryde’s, blue, pygmy blue, fin, beaked spp., short-finned and long-finned pilot, southern bottlenose, humpback, and pygmy and dwarf pygmy whales, southern right whale, southern right whale dolphin, and common, Risso’s, dusky, Indian ocean bottlenose and bottlenose dolphin, false killer and killer whales).
- Pinnipeds (Australian and New Zealand fur-seals, Australian sea-lion, southern elephant seal and subantarctic fur-seal).
- Reptiles (loggerhead, green, leatherback, hawksbill and flatback turtles).
- Birds (seabirds and shorebirds including albatrosses, petrels, shearwaters, white bellied sea eagle, osprey, fairy prion, sandpipers, terns, gulls, godwits, curlews, plovers, snipes, fork-tailed swift, knots, parrots, whimbrel, ruff, grey-tailed tattler and common greenshank).

Note: where Conservation Advice and/or Recovery Plans exist for protected marine fauna, OMP/SMPs and SOP/SAPs to be implemented will include consideration of any specific sampling and/or values that require monitoring.

The EP assessed receptor sensitivity within the EMBA as summarised in Table 6-10 below.

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Table 6-10: Otway Exploration Drilling Program - Resources at risk

Receptor	Sensitivity	Risk	Site Name and/or Location	Environmental Values and Sensitivities
Water Quality	Medium (surface to 30m)	Medium	Sea surface and top 30 m	Sea surface LOWC is expected to spread rapidly to low threshold. The extent of impact from entrained/dissolved MDO is limited to coastal waters less than 30 m deep.
Coastal Habitats/Communities	Medium	Medium	Sandy beaches, rocky shores, Coastal TECs, King Island Important Bird Area, Wetlands, Coastal Reserves	Sea surface LOWC is expected to spread rapidly to low threshold. The extent of impact from entrained/dissolved LOWC is limited to coastal waters less than 30 m deep. Shoreline loading at the low exposure threshold is unlikely to result in ecological impacts. Shorelines exposed to moderate concentrations of hydrocarbons are predicted to be small (av. length 2.5 km). Pre-spill OSTM does not predict shoreline exposures at the high threshold.
AMPs and State Marine Protected Areas	Medium-High	Low	Australian Marine Parks, State Marine Parks.	Sea surface LOWC is expected to spread rapidly to low threshold. The extent of the area of impact from entrained/dissolved LOWC is limited to coastal waters less than 30 m deep. Benthic values of AMPs are not expected to be impacted.
KEFs	Medium	Low	West Tasmania Canyons, Bonney upwelling coast, Other KEFs	Sea surface LOWC is expected to spread rapidly to low threshold. The extent of the area of impact from entrained/dissolved LOWC is limited to coastal waters less than 30 m deep. The values of KEFs are not expected to be impacted.
Plankton, Benthos, Fish and Reptiles	Low-Medium	Low	Benthic assemblages, marine flora, plankton, invertebrates, fish, sharks and marine reptiles (turtles)	Sea surface LOWC is expected to spread rapidly to low threshold. The extent of the area of impact from entrained and dissolved LOWC is limited to coastal < 30 m deep. <ul style="list-style-type: none"> - Plankton undertaking diel migration may be exposed to surface, entrained/dissolved LOWC. - Benthos/Invertebrates/Flora may be exposed to entrained/dissolved LOWC on shorelines/shallow waters <30 m. - Fish and marine turtles may be exposed to entrained/dissolved LOWC in mid-pelagic zone < 30m deep.
Birds	Medium-High	Medium	Seabirds, shorebirds, migratory birds and aquatic birds	Sea surface oil may impact seabirds and aquatic birds while foraging at sea. Entrained/dissolved LOWC may impact seabirds and aquatic birds foraging within top 30m. Shoreline oiling may impact shorebirds (i.e. in the IBA) and aquatic birds (i.e. Little Penguin with a BIA around Christmas Island). Coastlines potentially exposed to moderate shoreline loading are predicted to be rocky.

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Receptor	Sensitivity	Risk	Site Name and/or Location	Environmental Values and Sensitivities
Marine Mammals	Medium -High	Medium	Cetaceans and pinnipeds	Sea surface oil may impact pinnipeds while foraging/surfacing to breathe, and whales when foraging or migrating. Entrained/dissolved and shoreline LOWC may impact an Australian Fur-seal haul-out site at Reid Rocks, Tas at moderate threshold – pup weaning may be occurring at this time. Entrained/dissolved LOWC It is not expected to impact mobile/transient migrating cetaceans.
Socio-Economic Receptors	Medium-High	Medium	Fisheries, commercial shipping, defence, O&G infrastructure and water intakes, kelp harvesting, Vic desalination plant.	Potential impact through exclusion zones associated with spill and spill response for a short period of time. Recreational fishers and water sports (e.g. surfing, boating, diving) affected by limited shoreline loading. Infrastructure, vessels and equipment may become oiled, resulting in harvest/production delays. Concentrations of contaminants in fish/crustacean/mollusc tissues could be restricted for sale/human consumption until cleared by health authorities. In-water intakes may be affected by entrained/dissolved LOWC as most are sub-surface. Impacts at moderate thresholds may affect port operations.
Non-indigenous Heritage Sites	Low	Low	Shipwrecks	Shipwrecks potentially exposed to entrained/dissolved LOWC within shallow coastal waters <30m depth.
First Nations Heritage	Medium	Low	Victorian and Tasmanian Cultural Heritage	Cultural artifacts not expected to be contacted by shoreline loadings including shell middens, hut depressions, circular pits, stone artefact scatters, stone arrangements, rock engravings, shelters and human burials.

6.2. Monitoring Design

The design of monitoring programs should be based on clear aims and objectives and should ensure, as far as possible, that the planned monitoring activities are practicable and that the objectives of the program will be met. The design must result in collection of reliable situational data (OMPs) and robust scientific data (SMPs).

In the event of a spill, the Service Provider OSMP PM and technical scope leads, are likely to implement designs that apply one or more of the following approaches:

- Before-After-Control-Impact (BACI)
- Impact versus Control (IvC)
- Gradient of Impacts
- Lines of Evidence
- Control Charting.

The monitoring design(s) eventually chosen will consider the following:

- Temporal and spatial scale and potential effects of the spill
- Availability of baseline data and/or ability to rapidly obtain baseline data
- Time frame available to collect pre- and post-exposure data
- Speed of availability of OMP data
- Availability of appropriate reference (or control) sites
- Proposed statistical approaches for data analysis
- Range of potential chronic and acute effects on the receptors
- Monitoring frequency required to ensure short- and long-term impacts are detected
- Legislative requirements
- Logistic feasibility e.g. abundances of receptor species, ability to capture or measure
- Available resources and equipment to undertake the work in terms of personnel, logistics, and access.

One major aspect for consideration is the determination of 'impact' in survey design approaches. With respect to oil exposure, 'impacts' result from the combination of level of exposure and duration of exposure at that level (which is the key understanding behind ecotoxicity testing methods). It is recommended that 'impact' sites be identified following analysis of the results of the first survey and be rigorously tested after reviewing the data from each subsequent survey, as the spatial extent of impact zones is likely to evolve over time.

The modelled exposure of an offshore area does not necessarily equate to exposure to the benthos (or different parts of the water column). Therefore, exposure zones and impact locations are going to vary between OSMP scopes.

When finalising monitoring designs post-spill, the latest threatened species recovery plans and/or conservation advice will be reviewed to take into account any controls or restrictions that need to be implemented to prevent impacts from monitoring activities. These plans will also be reviewed to ensure that monitoring design is informed by contemporary information on Matters Protected under the EPBC Act and is consistent with relevant objectives, actions and monitoring priorities. Even when the intended design has been finalised, the approach to data collection will likely need to be modified depending on:

- The evolving nature and scale of the spill
- Weather and sea state conditions
- Situational awareness generated from OMPs
- Stakeholder input/concerns
- Directives from government agencies (including control agencies)
- Site locations and access given unforeseen logistical and safety constraints.

RPS technical scope leads will therefore be qualified (with appropriate skills and experience) to design and redesign the monitoring programs adaptively.

6.3. Baseline Information Sources

Baseline monitoring provides information on the condition of ecological receptors prior to, or spatially independent (e.g. if used in control chart analyses) of, a spill event and is used for comparison with postimpact scientific monitoring where required. This is particularly important for scientific monitoring where the ability to detect changes between pre-impact and post-impact conditions and evaluate impact from the spill (compared to natural variation and/or impacts unrelated to the spill) is necessary.

There are a number of existing baseline data sources, in addition to the Existing Environment section of the accepted EP, that can be accessed by ConocoPhillips in the event that the OSMP is implemented.

ConocoPhillips has engaged the OSM service provider, RPS AAP Consulting Pty Ltd (RPS), to conduct a detailed baseline analysis to identify additional data sources and to undertake a review to assess the spatial and temporal relevance of this data and comparison of methods and parameters to those outlined in the OMPs and SMPs, focusing on priority monitoring locations with minimum hydrocarbon contact timeframes so as to gain a better understanding of the response requirements. These information sources are included in OSMP Appendix 2.

The baseline data compilation in Appendix 2 will inform decision making on the appropriate experimental design. Where the Technical Scope Lead determines that there is insufficient baseline data, alternative approaches to BACI design, such as 'Impact versus Control', will be applied. In addition, for water and sediment quality monitoring, OSMP monitoring results may be compared with relevant guideline values set out in the Australian & New Zealand Guidelines for Fresh and Marine Water Quality.

Where there is insufficient time to obtain reactive baseline data ConocoPhillips Australia will assess whether additional baseline data are required to be collected.

6.3.1. Marine Data

The Australian Oceans Data Network (AODN): <https://portal.aodn.org.au/search> is the primary access point for search, discovery, access and download of data collected by the Australian marine community. Data are presented as a regional view of all the data available from the Australian Ocean Data Network. Primary datasets are contributed to by Commonwealth Government agencies, State Government agencies, Universities, the Integrated Marine Observing System (IMOS) an Australian Government Research Infrastructure project, and the Western Australia Marine Science Institute (WAMSI).

The Atlas of Living Australia (ALA): <https://www.ala.org.au/> is a collaborative, online, open resource that contains information on all the known species in Australia aggregated from a wide range of data providers.

It provides a searchable database when considering species within the EMBA. The ALA receives support from the Australian Government through the National Collaborative Research Infrastructure Strategy (NCRIS) and is hosted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

6.3.2. Climate and Oceanographic Data

The movement of any spill is expected to be dominated by the easterly flow of waters in Bass Strait and strong tidal currents. Prevailing west to south-westerly winter winds are expected to affect spread towards the northeast.

Meteorology and oceanographic data for the survey area can be found at:

- www.windy.com
- [Bass Strait and approaches Forecast \(bom.gov.au\)](http://Bass Strait and approaches Forecast (bom.gov.au))
- [Victoria and Tasmania \(bom.gov.au\)](http://Victoria and Tasmania (bom.gov.au))
- <http://oceancurrent.imos.org.au/tides/>
- https://maps.tidetech.org/?layer=ocean_current_speed_direction

7. Operational Monitoring Performance

7.1. OM01 Hydrocarbon and Other Chemical Spill Trajectory Prediction

Strategy	Description
Monitoring Performance Outcomes	<p>Carry out daily real-time predictions (forecasts) of the temporal / spatial distribution and concentrations of hydrocarbons on the surface and within the water column via numerical modelling to meet the following OPEP requirements:</p> <ul style="list-style-type: none"> In the event of a hydrocarbon release, provide operational data / information to monitor the weathering of hydrocarbons. Implement operational monitoring in accordance with the OPEP and OM01 to identify sensitivities at risk of hydrocarbon exposure, inform the NEBA and identify which sensitivities require scientific monitoring.
Methodology	<ul style="list-style-type: none"> Coordinate trajectory modelling by RPS Prepare for RPS information request Undertake ADIOS modelling Request access to Satellite Buoy Tracking Data from AMOSC Prepare update requests Receive model output and report
Action Checklist / Procedure	<p>Form 1: OM01 EUL Action Checklist - SPILL TRAJECTORY PREDICTION AND ASSESSMENT OF RECEPTORS AT RISK</p> <p>Form 2: OM01 Procedure for Initiating Spill Modelling</p>
Monitoring Performance Standards	Measurement Criteria
Readiness to implement OM01 Hydrocarbon and other chemical spill trajectory prediction	<ul style="list-style-type: none"> Ongoing membership with access to modelling service provider (RPS 24/7 OSTM support services and AMOSC Participating Member Contracts) provides operational forecast modelling. OM01 for operational forecast modelling developed by RPS in place and approved by EUL.
Provision of daily quasi-real-time predictions (forecasts) to inform operational responses (and scientific monitoring of sensitive locations).	<ul style="list-style-type: none"> Location, volume, start time and duration of spill provided to RPS by OSMP Program Manager to initiate modelling as soon as reasonably practicable (0 – 4 hours) after initial notification and provide spill modelling results within 5 hours of information provision. Use links to guides for: <ul style="list-style-type: none"> Quantifying the Volume of a Spill Manually Calculating a Spills Trajectory Daily information from operational monitoring studies OM02, OM03, OM04, OM05 and OM06 Up to 3-day hydrodynamic forecasts performed at least on a twice daily basis, to provide inputs to hydrocarbon fate modelling. Performed daily to incorporate updates to regional current hydrodynamic and wind forecasts. Model adjusted where applicable based on validation information provided by OM02. Availability of RPS personnel for advice and explanation of model results at any time (24 hour a day for 7 days a week).
Initiation Trigger	<ul style="list-style-type: none"> The ConocoPhillips Incident management team (IMT) Environment Unit Leader (EUL) will make the decision to activate OM01. OM01 will be activated by the Conoco Phillips IMT within four hours of the following initiation criteria being met: <ul style="list-style-type: none"> level 2 or level 3 hydrocarbon or other chemical spill; or the ConocoPhillips IMT EUL and/or Control Agency make the decision to activate OM01.

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Termination Criteria	<ul style="list-style-type: none">• The ConocoPhillips IMT EUL will make the decision to terminate OM01 based on the termination criteria, and• Implementation of OM01 shall continue until:<ul style="list-style-type: none">• confirmation is received that the hydrocarbon and other chemical release has ceased; and• the trajectory assessment indicates that sensitive receptors are no longer at risk of hydrocarbon contact at or above moderate thresholds (Form 1); or• the Control Agency has identified that the termination criteria for the response phase have been met.
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7.2. OM02 Hydrocarbon and Other Chemical Spill Surveillance and Reconnaissance

Strategy	Description
Monitoring Performance Outcomes	Conduct surveillance and tracking of surface hydrocarbon spill distribution to meet the following OPEP requirements: <ol style="list-style-type: none"> 1. Provide operational data / information to support and inform response planning and operations and monitor the spill response, and 2. Implement operational monitoring in accordance with the OPEP and OM02 to identify sensitivities at risk of hydrocarbon exposure, inform the NEBA and identify sensitivities which require scientific monitoring which sensitivities require scientific monitoring.
Methodology	<ul style="list-style-type: none"> • Coordinate aerial surveillance by AMOSC • Consider access to satellite data from AMOSC/OSRL • Consider activation of vessel surveillance by RPS • Report on findings to IMT
Action Checklist / Procedure	Form 3: OM02 EUL Action Checklist SPILL SURVEILLANCE AND RECONNAISSANCE TO DETECT RECEPTORS AT RISK
Monitoring Performance Standards	Monitoring Measurement Criteria
Readiness to implement OM02 Hydrocarbon and other chemical spill surveillance and reconnaissance	<ul style="list-style-type: none"> • Personnel to be sourced from a pool of resources under existing contracts and agreements (AMOSC). • Technical Scope Lead has arrangement in place with vessel and aircraft service provider. • OM02 (Hydrocarbon and other chemical spill surveillance and reconnaissance) in place and approved by Technical Scope Lead.
Acquisition of daily vessel-based and aerial surveys of hydrocarbon distributions.	<ul style="list-style-type: none"> • Consultation with Program Manager plans vessel and aircraft based daily surveillance activities on basis of model forecasts from OM01 and other available information. Day's vessel-based and aerial monitoring objective and plan are recorded on the daily report. • Field Operations Manager prepares summary of daily vessel-based and aerial surveillance activities for inclusion in daily report.
Daily informing for response planning and management.	<ul style="list-style-type: none"> • Daily report on hydrocarbon spill surveillance and tracking observations. Provided to the Program Manager, Technical Scope Lead and Field Operations Coordinator.
Provision of Final Surveillance and Tracking Overview Report and Data.	<ul style="list-style-type: none"> • Final Report to summarise surveillance and tracking data sufficiently to serve as the validation data set and to inform planning for post-incident scientific monitoring within 4 weeks after cessation of monitoring activities.
Initiation Trigger	<ul style="list-style-type: none"> • The ConocoPhillips Incident management team (IMT) EUL will make the decision to activate OM02. • OM02 will be activated by the Conoco Phillips IMT within two hours of the following initiation criteria being met: <ul style="list-style-type: none"> • level 2 or level 3 hydrocarbon or other chemical spill; or • the ConocoPhillips IMT EUL and/or Control Agency make the decision to activate OM02.
Termination Criteria	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to terminate OM02 when: <ul style="list-style-type: none"> • confirmation is received that hydrocarbon and/or other chemical release has ceased; and • surface sheens (as per Bonn Agreement Oil Appearance Code); subsurface plumes and shoreline accumulation are no longer detectable; or • the Control Agency has identified that the termination criteria for the response phase have been met.

7.3. OM03 Operational Monitoring of Hydrocarbon and Other Chemical Properties, Behaviour and Weathering

Strategy	Description
Monitoring Performance Outcomes	<p>To determine the physical and chemical properties of hydrocarbon as it weathers to characterise temporal decrease in toxicity to meet the following OPEP requirements:</p> <ul style="list-style-type: none"> • Provide operational data information to support and inform response planning and operations and monitor the spill response. • Implement operational monitoring in accordance with the OPEP and OM03 to identify sensitivities at risk of hydrocarbon exposure, inform the NEBA and identify which sensitivities.
Methodology	<ul style="list-style-type: none"> • Coordinate sampling by RPS • Provide the following information to RPS Program Manager <ul style="list-style-type: none"> • The nature and scale of the spill • location • when the incident took place • details of the hydrocarbon released (type and estimated release volume) • OMPs/SMPs that must be activated (as directed by the Control Agency) • Other relevant situational awareness information. • Provide assistance with collecting data if required using required monitors (hydrocarbon Fluorometer, YSI sonde multi-probe with refined fuels sensor and fDOM sensor for coastal monitoring, or interface meters) • Review and Report <ul style="list-style-type: none"> • Notify and provide IMT Planning team with updates. • Review results to determine on going monitoring • Provide updates to RPS • Obtain final sampling report following termination of OM03.
Action Checklist / Procedure	Form 4: OM03 EUL Action Checklist - HYDROCARBON PROPERTIES, BEHAVIOURS AND WEATHERING AT SEA
Monitoring Performance Standards	Measurement Criteria
Readiness to implement OM03 Operational monitoring of hydrocarbon and other chemical properties, behaviour and weathering	<ul style="list-style-type: none"> • Personnel to be sourced from a pool of resources under existing contracts and agreements (RPS). • Arrangement in place with vessel and aircraft service provider and access to NATA accredited analytical laboratory. • OM03 (Operational monitoring of hydrocarbon and other chemical properties, behaviour and weathering) in place and approved by EUL.
Acquisition of data on hydrocarbon chemical properties	<ul style="list-style-type: none"> • Planning monitoring survey on basis of information from Studies OM01, OM02 and coordination with other studies, and planned response activities. Vessel- based monitoring objective and plan recorded on the daily report. • Field Operations Manager carry out vessel-based sampling at nominated location along a longitudinal transect through the slick and water depths. Fluorescence and turbidity (in addition to temperature and salinity) profiles carried out initially to verify proxy indicators of dissolved aromatics and entrained hydrocarbons, respectively, and to select depths for sample collection. Water samples then collected and stored appropriately and organised for immediate couriering under holding time to analysis laboratory. Chain of Custody (CoC), Laboratory Receipt Notification and field records stored / archived by Field Operations Manager.

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Monitoring Performance Standards	Measurement Criteria
Characterise fate / weathering properties of hydrocarbon	<ul style="list-style-type: none"> • After each survey, the Field Operations Coordinator / Field Operations Manager carries out analyses of hydrocarbon data to characterise weathering characteristics with discussion on likely decrease in toxicity with weathering time on the basis of chemical composition of different ‘ages’ of hydrocarbon in terms of release into the marine environment. • Field Operations Coordinator / Field Operations Manager provides summary of fate / weathering properties of hydrocarbon in OM03 Final Report within 3 weeks of receipt of last report.
Informing spill response and Field Operations Manager	<ul style="list-style-type: none"> • Interim reports provided by Field Operations Coordinator after each survey, within one week of receipt of laboratory analysis provided to Program Manager, EUL (or delegate) and all Field Operations Coordinators. • OM03 Final Report summarising hydrocarbon weathering assessment (for informing NEBA of hydrocarbon persistence) provided by Field Operations Coordinator / Field Operations Manager within 4 weeks of final laboratory results to Program Manager, Technical Scope Lead (or delegate) and all Field Operations.
Initiation Trigger	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to activate OM03. OM03 will be implemented within seven days of the initiation criteria being met: <ul style="list-style-type: none"> • level 2 or level 3 hydrocarbon or other chemical spill • the ConocoPhillips IMT EUL and/or Control Agency make the decision to activate OM03. • Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that OM03 has been triggered. Deployment of field personnel and equipment into the field will be as per the timeframes specified in the OSMP.
Termination Criteria	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to terminate OM03. • In the absence of specified termination criteria, implementation of OM03 shall continue until: <ul style="list-style-type: none"> • the hydrocarbon/chemical has weathered such that the weathering assessment no longer informs operational response; and • concentrations of hydrocarbons and/or other chemicals in water are equal to or below relevant environmental guidelines (ANZECC/ARMCANZ 2000, ANZG 2018) species protection levels; or • the Control Agency has identified that the termination criteria for the response phase have been met.

7.4. OM04 Pre-emptive Assessment of Sensitive Receptors at Risk

Strategy	Description
Monitoring Performance Outcomes	<p>To assess the presence and extent of sensitive receptors based on a desktop review of existing data, where available, and to undertake a desk- based review of fate and weathering predictions and spill trajectory predictions, combined with the location of key environmental and socio- economic sensitive receptors to determine those at risk of being affected by the spill and/or response activities.</p> <ul style="list-style-type: none"> • Provide operational data / information to support and inform response planning and operations and monitor the spill response. • Implement operational monitoring in accordance with the OPEP and OM04 to identify sensitivities at risk of hydrocarbon exposure, inform the NEBA and identify which sensitivities require scientific monitoring.
Methodology	<p>Compile Baseline data Validate available information Compile overlays and assess information Review and Report</p>
Action Checklist / Procedure	Form 5: OM04 EUL Action Checklist - PRE-EMPTIVE ASSESSMENT OF RECEPTORS AT RISK
Monitoring Performance Standards	Measurement Criteria
Readiness to implement OM04 Pre-emptive assessment of sensitive receptors at risk	<ul style="list-style-type: none"> • Personnel to be sourced from pool of resources under existing contracts or agreements (RPS).
Acquisition of data on sensitive receptors at risk	<ul style="list-style-type: none"> • RPS Technical Lead is responsible for the acquisition of existing operational data and checking the format and accuracy of the reports sent to the IMT. • Technical Lead will send OM04 operational monitoring reports to the ConocoPhillips OSMP Implementation Lead in the IMT on a daily basis to maintain situational awareness and inform decision making. [Operational data prepared by RPS is to support and to inform response activities (including NEBA assessment) and other monitoring plans].
Informing spill response and Field Operations Manager	<ul style="list-style-type: none"> • OM04 operational reports provided to Program Manager and Technical Scope Lead to inform NEBA for assessment of response measures. OM04 outputs are to be integrated into the development of the Incident Action Plan. This will include, as relevant, information to help direct other OMPs and SMPs that may have been initiated.
Initiation Trigger	<ul style="list-style-type: none"> • OM04 is to be initiated within 12 hours of the initiation criteria being met: <ul style="list-style-type: none"> • level 2 or level 3 hydrocarbon or chemical spill • the ConocoPhillips IMT EUL will make the decision to activate OM04.
Termination Criteria	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to terminate OM04 based when: <ul style="list-style-type: none"> • spill response operations have been terminated; or • the ConocoPhillips IMT EUL and/or Control Agency will make the decision to terminate OM04.

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7.5. OM05 Operational Monitoring of Contaminated Sensitive Receptors

Strategy	Description
Monitoring Performance Outcomes	<p>To obtain information on the physical and biological character of both intertidal and subtidal habitats and organisms prior to hydrocarbon exposure at priority shorelines to establish an operational baseline condition, to monitor post-exposure hydrocarbon distribution and the physical and biological character of the shoreline, and to measure effectiveness of shoreline response measures to meet the following OPEP requirements:</p> <ul style="list-style-type: none"> • Provide operational data / information to support and inform response planning and operations and monitor the spill response. • Implement operational monitoring in accordance with the OPEP and OM05 to identify sensitivities at risk of hydrocarbon exposure, inform the NEBA and identify which sensitivities require scientific monitoring. • Provide a shoreline clean-up response that is appropriate for the nature and scale of shoreline impacts. • Monitor the effectiveness of response and clean-up operations along shorelines.
Methodology	<p>Coordinate reconnaissance surveys Delineate shoreline sectors and segments - Refer to OSRL SCAT Field Guide Coordinate SCAT and OWR support Liaise with Regulators to confirm oiled wildlife response Review and Report</p>
Action Checklist / Procedure	Form 6: OM05 EUL Action Checklist - OPERATIONAL MONITORING OF CONTAMINATED SENSITIVE RECEPTORS
Monitoring Performance Standards	Measurement Criteria
Readiness to implement OM05 Operational monitoring of sensitive receptors.	<ul style="list-style-type: none"> • Personnel (Shoreline Clean-up Assessment Team, SCAT) to be sourced from pool of resources under existing contracts or agreements (via AMOSC). • Arrangement in place with vessel and aircraft service provider. • All SCAT members have undertaken AMOSC operations training in shoreline response (or equivalent competency).
Acquisition of shoreline baseline information prior to hydrocarbon exposure at priority shorelines	<ul style="list-style-type: none"> • OM05 has nominated priority sensitive receptors for acquisition of baseline information based on modelled risk of contact. Any re-prioritisation on the basis of potential hydrocarbon shoreline exposure risk to be informed by model forecasts from Studies OM01 and OM02 and direction from the IMT or state authorities. • SCAT mobilised within 0-48 hours (via AMOSC). • SCAT carry out baseline assessment as per OM05 including both intertidal and subtidal habitats and organisms. Field records backed-up and archived at priority shorelines. • Baseline data prepared by RPS to facilitate rapid comparison of any post-exposure sensitive receptor surveys at same location. Report submitted to Technical Scope Lead (or delegate) within one week of final baseline survey day.
Acquisition of shoreline data post-exposure to inform effectiveness of preventative or clean-up measures	<ul style="list-style-type: none"> • Field Operations Coordinator directed by Program Manager and Technical Scope Lead (or delegate) to sensitive receptor to carry out post-exposure assessments against baseline. The survey plan recorded on the field documentation. • SCAT (via AMOSC) carry out post-exposure sensitive receptor assessments as per OM05 IP including visual observations of shoreline including substrate (e.g., sand), biological character (e.g., shorebirds, hydrocarbon impacts) and hydrocarbon distribution (if any) on shoreline (e.g., hydrocarbon position, thickness, depth, total hydrocarbon coverage area). Field records (hard copy and digitised data) archived.
Real-time informing of other spill response and	<ul style="list-style-type: none"> • Daily assessment of visual observations of sensitive receptor including substrate, biological character and hydrocarbon distribution (if any) on sensitive receptor.

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<p>Field Operations Manager</p>	<ul style="list-style-type: none"> • Twice-daily in-field assessments of effectiveness and impacts of clean-up response measures and preventative response measures. • Information provided to Program Manager and EUL (or delegate) to inform NEBA for assessment of response measures, and effectiveness of implemented measures. • SCAT Teams to immediately notify Program Manager and Technical Scope Lead (or delegate) of hydrocarbon impacted coastal wildlife (e.g., shorebirds) to inform potential Oiled Wildlife Response measures.
<p>Assess toxicity / weathering of sensitive receptor hydrocarbon</p>	<ul style="list-style-type: none"> • Periodic Hydrocarbon Assessment reports on the chemical composition from shoreline samples sent from the laboratory summarised and evaluated to estimate toxicity (i.e. inferred from hydrocarbon composition) and degradation rates of various hydrocarbon components (i.e., weathering). To be provided within one week of receipt of Laboratory Analysis Report. • Information provided to Program Manager and Technical Scope Lead to inform NEBA for assessment of response measures.
<p>Provision of Final Surveillance and Tracking Overview Report and Data</p>	<ul style="list-style-type: none"> • Final Report to summarise OM05 to be sufficiently detailed to serve as a validation data set of sensitive receptor hydrocarbon distribution and weathering and to inform planning for post-incident scientific monitoring, within 4 weeks of the cessation of study,
<p>Initiation Trigger</p>	<ul style="list-style-type: none"> • OM05 is to be implemented within two days of the following initiation criteria being met: <ul style="list-style-type: none"> • level 2 or level 3 hydrocarbon/chemical spill; or • level 1 spill in the event that the spill extends beyond 500 m from the source and the source has not been contained. • The ConocoPhillips IMT EUL will make the decision to activate OM05 based on the initiation criteria. Preparation to deploy personnel and equipment will then commence upon notification from ConocoPhillips IMT that the OMP has been triggered.
<p>Termination Criteria</p>	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to terminate OM05 based on the following termination criteria: <ul style="list-style-type: none"> • confirmation that hydrocarbon/chemical release has ceased; and • spill response operations have been terminated.

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7.6. OM06 Air Quality Modelling (Responder Health and Safety) Scientific Monitoring

Strategy	Description
Monitoring Performance Outcomes	<ul style="list-style-type: none"> Carry out real-time predictions (forecasts) to determine: <ul style="list-style-type: none"> The direction, concentration, movement and persistence of VOCs; The effect of any potential changes in discharge rate and prevailing environmental conditions to the hazardous zones; and The geographical extent of the lower explosive limit (LEL).
Methodology	<p>Initial Air quality trajectory modelling (AQTM) will be undertaken in accordance with the OPEP and OM06.</p> <p>Update modelling as required.</p> <p>Field validation sampling.</p> <p>Data uploaded and QA/QC review.</p> <p>Review and report</p>
Action Checklist / Procedure	OM06: Air Quality Modelling (Responder Health and Safety) data request form
Monitoring Performance Standards	Measurement Criteria
Readiness to implement OM06 Air Quality Modelling (Responder Health and Safety) Scientific Monitoring	<ul style="list-style-type: none"> Ongoing membership with access to modelling service provider (RPS 24/7 OSTM support services) provides operational forecast modelling. OM06 for Air Quality Modelling (Responder Health and Safety) by RPS in place and approved by EUL.
Provision of daily quasi-real-time predictions (forecasts) to inform operational responses (and scientific monitoring of sensitive locations).	<ul style="list-style-type: none"> OSMP Program Manager to initiate modelling as soon as reasonably practicable (0 – 4 hours) after initial notification and provide air quality trajectory modelling (AQTM) results within 5 hours of information provision. Daily information from operational monitoring studies OM02, OM03, OM04, and OM05 Updated modelling should be undertaken every 6 – 12 hours after request to the air quality modelling provider. Accurate vapour modelling requires more frequent modelling than oil spill modelling as well as regular in field validation. Model adjusted where applicable based on validation information provided by OM02 and OM03. Availability of RPS personnel for advice and explanation of model results at any time (24 hour a day for 7 days a week) Air quality trajectory modelling outputs and reporting, including GIS datasets, will be provided to the EUL to be used to maintain situational awareness and advise response strategy requirements and will be integrated into the development of Incident Action Plans (IAPs)
Initiation Trigger	<ul style="list-style-type: none"> The ConocoPhillips Incident management team (IMT) Environment Unit Leader (EUL) will make the decision to activate OM06. OM06 will be activated by the Conoco Phillips IMT within two hours of the following initiation criteria being met: <ul style="list-style-type: none"> level 2 or level 3 hydrocarbon or other chemical spill has occurred; and Adverse air quality may pose a risk to response personnel/public; or the ConocoPhillips IMT EUL and/or Control Agency make the decision to activate OM06
Termination Criteria	<ul style="list-style-type: none"> The ConocoPhillips IMT EUL will make the decision to terminate OM06 based on the termination criteria, and implementation of OM06 shall continue until:

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	<ul style="list-style-type: none">• Completion of the gas, vapour and hydrocarbon discharge, containment and recovery, dispersant operations and shoreline clean-up operations; and• Continuing hazardous and noxious plume detection modelling has a low probability of contribution or influencing spill response decision making.
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8. Scientific Monitoring Performance

8.1. SM01 Monitoring of Hydrocarbons and Other Chemicals in Marine Waters

Strategy	Description
Monitoring Performance Outcomes	<p>Monitor hydrocarbon and dispersant content (if used in response) in marine waters at sub-tidal and intertidal impact sites (which may include where relevant: priority/sensitive locations, State or Commonwealth marine protected areas, pelagic sites, commercial fishery areas) and reference sites to support the assessment of environmental impacts and recovery. This will be used for:</p> <ul style="list-style-type: none"> Informing response planning of hydrocarbon and dispersant content (if used in response) concentrations in marine waters at priority sensitive locations as a NEBA input during the incident.
Methodology	<p>Coordinate sampling by RPS. Develop and implement sampling design. Complete OM03 checklists. Review and report.</p>
Action Checklist / Procedure	Form 8: SM01 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM01 monitoring program.	<ul style="list-style-type: none"> Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel service provider. SAP development for SM01 will include review of the South-east Marine Parks Network Management Plan, and incorporation of relevant context to ensure alignment where relevant.
Appropriate collection, transport and analysis of water samples.	<ul style="list-style-type: none"> Field Operations Manager to collect and store water samples, and keep field records (e.g., field book, checklists) as per the SM01 IP. CoC to confirm sample collection, transport to appropriate laboratories, and sample receipt notification from the NATA-accredited laboratory (e.g., ALS) to confirm arrival of water samples within holding times. Documents stored / archived by Field Operations Manager. Laboratory Analysis Report issued by NATA-accredited laboratory with analyte list defined in the IP (within 3 weeks of sample collection) and store by Field Operations Manager.
Acquisition and dissemination of water quality data for hydrocarbons in water	<ul style="list-style-type: none"> Field Operations Manager collects water quality data as soon as possible at sensitive priority areas, commercial fishery areas, pelagic sites and reference sites as per the SM01. Field Operations Manager store / archive field records. Field Operations Coordinator to provide hydrocarbon and dispersant (if used in response) in Marine Waters Survey (within one week of receipt of Laboratory Analysis Report) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.
Acquisition of hydrocarbon data from marine waters during the hydrocarbon release and for 3 months after the cessation of the release	<ul style="list-style-type: none"> Collection and analysis of hydrocarbon and dispersant (if used in response) concentrations in marine waters as prescribed in the SM01 IP by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field Operations Coordinator to provide a short report for each survey (within one week of receipt of Laboratory Analysis Report) to EUL (or delegate). Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.

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Monitoring Performance Standards	Measurement Criteria
Revise SM for long-term monitoring phase of hydrocarbons in water after the cessation of the hydrocarbon release and carry out long-term monitoring phase.	<ul style="list-style-type: none"> • Field Operations Coordinator to consider final information / results in the revision of the IP for the long-term monitoring phase of hydrocarbons in marine waters after the cessation of the hydrocarbon release. • Field Operations Coordinator revises SM01 IP for long-term monitoring phase of hydrocarbons in water within 3 months after cessation of hydrocarbon releases and provides to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve revision to SM01 IP for long-term monitoring phase of hydrocarbons in marine waters within 8 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. • Field Operations Coordinator responsible for implementation of Long-Term Monitoring Phase of the SM01 IP.
Assess impact of hydrocarbons in marine waters	<ul style="list-style-type: none"> • Field Operations Coordinator responsible to assess the impact of hydrocarbons and dispersant (if used in response) in marine waters within survey (single survey), annual (data to date, EP reporting commitment) and final (all data) reports relative to the established baseline condition and the reference sites as prescribed in SM02 IP.
Regulatory compliance reporting.	<ul style="list-style-type: none"> • Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM01 Scientific Monitoring. • Report within 4 weeks of approval by the Technical Scope Lead (or delegate)
Initiation Trigger	<ul style="list-style-type: none"> • SM01 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill. SM01 will be activated by the ConocoPhillips Incident management team (IMT) Environment Unit Leader (EUL) as soon as is practicable following initial notification of the spill. Survey planning and preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Mobilisation of personnel and equipment into the field will commence within seven days of receipt of notification.
Termination Criteria	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to terminate SM01 once: <ul style="list-style-type: none"> • concentrations of hydrocarbons and/or other chemicals in water are either equivalent to comparable reference sites in the study area, or • concentrations of hydrocarbons and/or other chemicals in water are equal to or below limits of detection relevant to ANZG 2018 guideline levels or United States Environmental Protection Authority (US EPA) Water Quality Benchmarks for Aquatic Life reference levels.

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8.2. SM02 Monitoring of Hydrocarbons and Other Chemicals in Benthic Sediments

Strategy	Description
Monitoring Performance Outcomes	<p>Monitor hydrocarbons in marine sediments at sub-tidal (rocky reef) and intertidal (sandy beaches) sensitive locations, pelagic sites, commercial fishery areas and reference sites to support assessment of environmental impacts and recovery. This will be used for:</p> <ul style="list-style-type: none"> Informing response planning of hydrocarbon concentrations in sediments at priority sensitive locations to inform the NEBA during the incident.
Methodology	<p>Coordinate sampling by RPS. Develop and implement sampling design. Complete OM03 checklists. Review and report.</p>
Action Checklist / Procedure	Form 9: SM02 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM02 monitoring program.	<ul style="list-style-type: none"> Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel service provider. SAP development for SM02 will include review of the South-east Marine Parks Network Management Plan, and incorporation of relevant context to ensure alignment where relevant.
Appropriate collection, transport and analysis of sediment samples.	<ul style="list-style-type: none"> Field Operations Manager to collect and store sediment samples, and keep field records (e.g., field book, checklists) as per the SM02 IP. CoC to confirm sample collection, transport to appropriate laboratories, and sample receipt notification from the NATA-accredited laboratory (e.g., ALS) to confirm arrival of sediment samples within holding times. Documents stored / archived by Field Operations Manager. Laboratory Analysis Report issued by NATA-accredited laboratory with analyte list defined in the IP (within 3 weeks of sample collection) and store by Field Operations Manager.
Acquisition and dissemination of sediment quality data for hydrocarbons in water	<ul style="list-style-type: none"> Field Operations Manager collects sediment quality data as soon as possible at sensitive priority areas, commercial fishery areas, pelagic sites and reference sites as per the SM02. Field Operations Manager store / archive field records. Field Operations Coordinator to provide hydrocarbon and dispersant (if used in response) in Marine Sediment Survey (within one week of receipt of Laboratory Analysis Report) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.
Acquisition of hydrocarbon data from marine sediment during the hydrocarbon release and for 3 months after the cessation of the release	<ul style="list-style-type: none"> Collection and analysis of hydrocarbon and dispersant (if used in response) concentrations in marine sediment as prescribed in the SM02 by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field Operations Coordinator to provide a short report for each survey (within one week of receipt of Laboratory Analysis Report) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.

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Monitoring Performance Standards	Measurement Criteria
<p>Revise SM for long-term monitoring phase of hydrocarbons in sediment after the cessation of the hydrocarbon release and carry out long-term monitoring phase.</p>	<ul style="list-style-type: none"> Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of hydrocarbons in marine waters after the cessation of the hydrocarbon release. Field Operations Coordinator revises SM02 for long-term monitoring phase of hydrocarbons in sediment within 3 months after cessation of hydrocarbon releases and provides to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve revision to SM02 for long-term monitoring phase of hydrocarbons in marine sediment within 8 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. Field Operations Coordinator responsible for implementation of Long-Term Monitoring Phase of the SM02 IP.
<p>Assess impact of hydrocarbons in marine sediment</p>	<ul style="list-style-type: none"> Field Operations Coordinator responsible to assess the impact of hydrocarbons and dispersant (if used in response) in marine waters within survey (single survey), annual (data to date, EP reporting commitment) and final (all data) reports relative to the established baseline condition and the reference sites as prescribed in the SM02 IP.
<p>Regulatory compliance reporting.</p>	<ul style="list-style-type: none"> Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM02 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
<p>Initiation Trigger</p>	<ul style="list-style-type: none"> SM02 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill. Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Mobilisation of field personnel and equipment will commence within seven days of receipt of notification. The ConocoPhillips IMT Environment Unit Leader will make the decision to activate SM01 based on the initiation criteria: <ul style="list-style-type: none"> Spill trajectory modelling, surveillance or monitoring (OM01 to OM05) predicts hydrocarbon/chemical contact with a sensitive receptor that is closely linked to marine sediments; or Other SMPs are triggered that require information on the presence, extent and toxicity/persistence of hydrocarbons and other chemicals in the water column (SM04, SM05 and SM08).
<p>Termination Criteria</p>	<ul style="list-style-type: none"> The outputs of this SMP will be used to determine whether the termination criteria for this SMP have been achieved. The ConocoPhillips IMT will make the decision to terminate this SMP when: <ul style="list-style-type: none"> Monitoring has established the temporal and spatial distributions and nature of hydrocarbons and other chemicals resulting from the spill; or Monitoring results indicate that the concentrations of petrogenic hydrocarbons and other chemicals resulting from the spill are equal to or below ANZG 2018 guidelines where parameter values exist. The US EPA Water Quality Benchmarks for Aquatic Life reference levels will be used in any instance where a particular parameter guideline value does not exist in the ANG 2018 guidelines.

8.3. SM03 Survey of Shoreline and Intertidal Sediments and Biological Communities to Determine Impact of Hydrocarbon/Chemical Spill and Recovery

Strategy	Description
Monitoring Performance Outcomes	Monitor intertidal sediments and biological communities at priority sensitive locations and one reference site to support the assessment of environmental impacts and recovery. This will be used to: <ul style="list-style-type: none"> • Quantify the distribution, abundance and community composition of marine organisms in soft sediment and hard substrate environments. • Quantify the level of exposure to affected communities. • Determine the impact and recovery of the hydrocarbon release on those habitats.
Methodology	Coordinate sampling by RPS. Develop and implement sampling design. Complete OM03 checklists. Review and report.
Action Checklist / Procedure	Form 10: SM02 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM03 monitoring program.	<ul style="list-style-type: none"> • Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel service provider. • Arrangements in place for specialised monitoring equipment (e.g., video / drop cameras).
Reactive baseline monitoring and establishment of intertidal benthic habitat monitoring sites	<ul style="list-style-type: none"> • Field Operations Coordinator to consider outputs from OM01 and OM02 to prioritise sensitive priority areas for the establishment of monitoring sites and gathering reactive monitoring data.
Acquisition and dissemination of existing intertidal habitat baseline data	<ul style="list-style-type: none"> • Field Operations Coordinator responsible for the acquisition of existing baseline intertidal data from various sources to establish the baseline dataset. • Field Operations Coordinator to provide SM03 Baseline Report (within 8 weeks of hydrocarbon release) to Technical Scope Lead (or delegate) to approve within two weeks of submission and distribute to Program Manager and other Field Operations Coordinators.
Acquisition of intertidal benthic surveys during the hydrocarbon release and for 3 months after the cessation of the release	<ul style="list-style-type: none"> • Field Operations Manager to routinely carry out scientific surveys of intertidal benthic habitat sites at priority sensitive locations and reference site during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field records, photos, video and other data to be stored/archived. • Field Operations Coordinator to provide a short report for each survey (within 4 weeks of completion of field survey) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.

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Monitoring Performance Standards	Measurement Criteria
Revise SM for long-term monitoring phase of intertidal benthic habitats after hydrocarbon release and carry out long-term monitoring phase.	<ul style="list-style-type: none"> Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of intertidal benthic habitats after the cessation of the hydrocarbon release. Field Operations Coordinator revises SM03 for long-term monitoring phase of intertidal and benthic habitats within 3 months after cessation of hydrocarbon releases and provides to Technical Scope Lead (or delegate) within 8 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. Field Operations Coordinator responsible for implementation of Long-Term Monitoring Phase of the SM.
Assess impact of hydrocarbons release on intertidal benthic habitats	<ul style="list-style-type: none"> Field Operations Coordinator responsible to assess the impact of intertidal benthic habitats within survey (single survey), annual (data to date, EP reporting commitment) and final (all data) reports relative to the established baseline condition and the reference sites as prescribed in the SM03 IP. Field Operations Coordinator responsible to report data and to assess the impact of hydrocarbons on intertidal benthic habitats in the survey (single survey), annual (data to date, EP reporting commitment) and final (all data) reports relative to the established baseline condition and the reference sites. Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) with a SM03 Chapter for Annual Report as requested each year and the Final Report within 8 weeks of field termination. After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve Final Report within 2 months of field termination for dissemination.
Regulatory compliance reporting.	<ul style="list-style-type: none"> Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM03 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate)
Initiation Trigger	<ul style="list-style-type: none"> SM03 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill and the initiation triggers are activated. Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Deployment of field personnel and equipment into the field is planned within seven days of receipt of notification. The ConocoPhillips IMT Environment Unit Leader will make the decision to activate SM03 based on the initiation criteria: <ul style="list-style-type: none"> Spill trajectory modelling, surveillance or monitoring (OM01 to OM05) predicts hydrocarbon contact with a sensitive resource; or Other scientific monitoring programs are triggered that require information on the presence, extent, toxicity and persistence of hydrocarbons/chemicals in key habitats or to sensitive receptors (SM04 and SM05).
Termination Criteria	<ul style="list-style-type: none"> The outputs from SM03 will be used to determine whether the termination criteria for this SMP have been met. The ConocoPhillips IMT EUL will make the decision to terminate this SMP when: <ul style="list-style-type: none"> Monitoring has quantified the temporal and spatial distribution of hydrocarbons and other chemicals in intertidal sediments and biological communities and affected intertidal biological communities have returned to baseline conditions and show no detectable sublethal and lethal impacts in comparison to controls sites; or Monitoring results indicate that the concentrations of hydrocarbons/chemicals resulting from the spill are equal to or below reference/pre-exposure

8.4. SM04 Monitoring of Subtidal Benthos to Determine Impact of Hydrocarbon/Chemical Spill and Recovery

Strategy	Description
Monitoring Performance Outcomes	<p>Monitor subtidal benthos and biological communities at priority sensitive locations and one reference site to support the assessment of environmental impacts and recovery. This will be used to:</p> <ul style="list-style-type: none"> Quantify the distribution, abundance and community composition of marine organisms in subtidal benthos environments. Quantify the level of exposure to affected communities. Determine the impact and recovery of the hydrocarbon release on those habitats.
Methodology	<p>Coordinate sampling by RPS. Develop and implement sampling design. Complete checklists. Review and report.</p>
Action Checklist / Procedure	Form 11: SM04 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM04 monitoring program.	<ul style="list-style-type: none"> Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel service provider. Arrangements in place for specialised monitoring equipment (e.g., video / drop cameras). SAP development for SM04 will include review of the South-east Marine Parks Network Management Plan, and incorporation of relevant context to ensure alignment where relevant.
Reactive baseline monitoring and establishment of subtidal benthic habitat monitoring sites	<ul style="list-style-type: none"> Field Operations Coordinator to consider outputs from OM01 and OM02 to prioritise sensitive priority areas for the establishment of monitoring sites and gathering reactive monitoring data.
Acquisition and dissemination of existing subtidal habitat baseline data	<ul style="list-style-type: none"> Field Operations Coordinator responsible for the acquisition of existing baseline subtidal data from various sources to establish the baseline dataset. Field Operations Coordinator to provide SM04 Baseline Report (within 8 weeks of hydrocarbon release) to Technical Scope Lead (or delegate) to approve within two weeks of submission and distribute to Program Manager and other Field Operations Coordinators.
Acquisition of subtidal benthic surveys during the hydrocarbon release and for 3 months after the cessation of the release	<ul style="list-style-type: none"> Field Operations Manager to routinely carry out scientific surveys of subtidal benthic habitat sites at priority sensitive locations and reference site during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field records, photos, video and other data to be stored/archived. Field Operations Coordinator to provide a short report for each survey (within 4 weeks of completion of field survey) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.

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Monitoring Performance Standards	Measurement Criteria
<p>Revise SM for long-term monitoring phase of subtidal benthic habitats after hydrocarbon release and carry out long-term monitoring phase.</p>	<ul style="list-style-type: none"> • Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of subtidal benthic habitats after the cessation of the hydrocarbon release. • Field Operations Coordinator revises SM04 for long-term monitoring phase of subtidal benthic habitats within 3 months after cessation of hydrocarbon releases and provides to Technical Scope Lead (or delegate) within 8 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. • Field Operations Coordinator responsible for implementation of Long-Term Monitoring Phase of the SM.
<p>Assess impact of hydrocarbons release on subtidal benthic habitats</p>	<ul style="list-style-type: none"> • Field Operations Coordinator responsible to assess the impact of subtidal benthic habitats within survey (single survey), annual (data to date, EP reporting commitment) and final (all data) reports relative to the established baseline condition and the reference sites as prescribed in the SM04 IP. • Field Operations Coordinator responsible to report data and to assess the impact of hydrocarbons on subtidal benthic habitats in the survey (single survey), annual (data to date, EP reporting commitment) and final (all data) reports relative to the established baseline condition and the reference sites. • Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) with a SM04 Chapter for Annual Report as requested each year and the Final Report within 8 weeks of field termination. After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve Final Report within 2 months of field termination for dissemination.
<p>Regulatory compliance reporting.</p>	<ul style="list-style-type: none"> • Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM04 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
<p>Initiation Trigger</p>	<ul style="list-style-type: none"> • SM04 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill. Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Deployment of field personnel and equipment into the field is planned within seven days of receipt of notification. • The ConocoPhillips IMT Environment Unit Leader will make the decision to activate SM05 based on the following initiation criteria: <ul style="list-style-type: none"> • Spill trajectory modelling, surveillance or monitoring (OM01 to OM05) predicts hydrocarbon contact with a sensitive subtidal benthic habitat/community; and/or • Results from OM04 indicate that hydrocarbon has or is likely to have reached a shoreline
<p>Termination Criteria</p>	<ul style="list-style-type: none"> • Implementation of SM04 should continue until: <ul style="list-style-type: none"> • monitoring shows restoration or resumption of key biological processes (e.g., reproduction and recruitment) necessary for post impact recovery is demonstrated by affected marine benthos; or • sediment samples indicate that levels of hydrocarbons are equal to or below reference / pre-impact levels. • The ConocoPhillips IMT Environment Unit Leader will make the decision to terminate this SMP when the above criteria are met.

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8.5. SM05 Wildlife surveys to Determine Impact of Hydrocarbon/Chemical Spill on Shorebirds and Seabirds

Strategy	Description
Monitoring Performance Outcomes	<p>Monitor shorebird and seabird populations to assess potential impacts to, and subsequent recovery following a hydrocarbon release. This will be used to:</p> <ul style="list-style-type: none"> Quantify the level of exposure to affected populations. Provide operational response resources to implement secondary and tertiary oiled wildlife response strategies. Assess any impacts to shorebirds or seabirds resulting from response activities. Determine the recovery of populations after hydrocarbon release.
Methodology	<p>Coordinate survey and oiled bird response by RPS. Develop and implement sampling design. Prepare for fauna collection and tissue sampling Complete checklists. Review and report.</p>
Action Checklist / Procedure	Form 12: SM05 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM05 monitoring program.	<ul style="list-style-type: none"> Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel service provider. SAP development for SM05 will include review of relevant seabird and shorebird plans of management under the EPBC Act, and incorporation of relevant context to ensure alignment where relevant.
Acquisition and dissemination of existing shorebird and seabird population baseline data	<ul style="list-style-type: none"> Field Operations Coordinator responsible for the acquisition of existing shorebird and seabird population baseline data from various sources to establish the baseline dataset. Field Operations Coordinator to provide SM05 Monitoring Baseline Data Report (within 8 weeks of hydrocarbon release) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 2 weeks of chapter submission, and to distribute to Program Manager and other Field Operations Coordinators.
Acquisition of shorebird and seabird populations monitoring data during the hydrocarbon release and for 3 months after the cessation of hydrocarbon release	<ul style="list-style-type: none"> Collection and analysis of shorebird and seabird population data from- priority sensitive locations and predicted impact and reference sites, at frequencies prescribed in the SM05 by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field Operations Manager to store / archive field records at secure site. Field Operations Coordinator to provide a short data report summarising each field survey within 4 weeks of completion of each field survey to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 1 week of submission and distribute to Program Manager and other Field Operations Coordinators.
Revise SM for long-term monitoring phase of shorebird and seabird populations after the hydrocarbon release and carry out long-term monitoring phase	<ul style="list-style-type: none"> Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of shorebird and seabird populations after cessation of hydrocarbon release. Field Operations Coordinator revises SM for long-term monitoring phase of shorebird and seabird populations within 4 weeks after Final Report approval and provides to Technical Scope Lead (or delegate) to approve revision to SM05 for long-term monitoring phase of shorebird and seabird populations within 4 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager.

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	<ul style="list-style-type: none"> Field Operations Coordinator responsible for implementation of revised long- term phase SM05.
Monitoring Performance Standards	Measurement Criteria
Assess impact of hydrocarbon release on shorebird and seabird populations and provision of performance reporting	<ul style="list-style-type: none"> Field Operations Coordinator responsible to assess and to report on monitoring of shorebird and seabird populations for each survey (single survey), annual (data to date, EP performance report) and final (all data) reports relative to the established baseline condition and the reference sites. Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) the SM05 Chapter for Annual Reports as specified by the Technical Scope Lead (or delegate) each year and the Shorebird and Seabird Population Monitoring Final Report within 8 weeks of field termination. After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve Final Shorebird and Seabird Population Monitoring Report within 3 months of field termination for dissemination.
Regulatory compliance reporting	<ul style="list-style-type: none"> Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM05 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
Initiation Trigger	<ul style="list-style-type: none"> SM05 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill and where initiation criteria are triggered. Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Commencement of field personnel and equipment deployment into the field is planned to be within seven days of receipt of notification. The ConocoPhillips IMT EUL will make the decision to activate SM05 based on the initiation criteria: <ul style="list-style-type: none"> Spill trajectory modelling, surveillance or monitoring (OM01 to OM05) predicts possible contact to seabird or shorebird populations or to any of their habitats of importance for breeding, nesting or foraging; or Monitoring (OM05) has identified contact or an impact to seabird or shorebird populations as a result of the hydrocarbon/chemical spill; or There are reports or scientific evidence of oiled seabird or shorebird populations.
Termination Criteria	<ul style="list-style-type: none"> The ConocoPhillips IMT EUL will make the decision to terminate this SMP when: <ul style="list-style-type: none"> There has been no demonstrable evidence of an impact on seabirds and/or shorebirds from the hydrocarbon/chemical spill; or Key seabird and shorebird behaviour and breeding activities have been quantified in the zone of exposure and are comparable to reference sites; or Measured parameters have returned to baseline conditions (taking into account natural variability) in terms of breeding population (for seabirds) or counts (for shorebirds) and impacts on species and taxa are no longer detectable, with regard to reference sites.

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8.6. SM06 Wildlife surveys to Determine Impact of Hydrocarbon/Chemical Spill on Marine Megafauna

Strategy	Description
Monitoring Performance Outcomes	Undertake marine megafauna monitoring to assess: <ul style="list-style-type: none"> • The impacts and disturbance to marine megafauna, and • Monitor the recovery of shoreline megafauna following a hydrocarbon release.
Methodology	Coordinate sampling by RPS. Develop and implement survey design. Prepare for fauna collection and tissue sampling Complete checklists. Review and report.
Action Checklist / Procedure	Form 13: SM06 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM06 monitoring program.	<ul style="list-style-type: none"> • Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel and aircraft service provider. • SAP development for SM06 will include review of relevant marine megafauna plans of management under the EPBC Act, and incorporation of relevant context to ensure alignment where relevant.
Acquisition and dissemination of existing marine megafauna baseline data	<ul style="list-style-type: none"> • Field Operations Coordinator responsible for the acquisition of existing marine megafauna baseline data from various sources to establish the baseline dataset. • Field Operations Coordinator to provide SM06 Monitoring Baseline Data Report (within 8 weeks of hydrocarbon release) to Technical Scope Lead (or delegate). • Technical Scope Lead (or delegate) to approve within 2 weeks of chapter submission, and to distribute to Program Manager and other Field Operations Coordinators.
Acquisition of marine megafauna survey data during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release	<ul style="list-style-type: none"> • Collection and analysis of marine megafauna data from- priority sensitive locations and predicted impact and reference sites, at frequencies prescribed in the SM06 by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field Operations Manager to store / archive field records at secure site. • Field Operations Coordinator to provide a short data report summarising each field survey within 4 weeks of completion of each field survey to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 1 week of submission and distribute to Program Manager and other Field Operations Coordinators.
Revise SM for long-term monitoring phase of marine megafauna surveys after the hydrocarbon release and carry out long-term monitoring phase	<ul style="list-style-type: none"> • Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of marine megafauna after cessation of hydrocarbon release. • Field Operations Coordinator revises SM for long-term monitoring phase of marine megafauna within 4 weeks after Final Report approval and provides to Technical Scope Lead (or delegate) to approve revision to SM06 for long-term monitoring phase of Marine megafauna within 4 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. • Field Operations Coordinator responsible for implementation of revised long-term phase SM06.

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Monitoring Performance Standards	Measurement Criteria
Assess impact of hydrocarbon release on marine megafauna and provision of performance reporting	<ul style="list-style-type: none"> • Field Operations Coordinator responsible to assess and to report on monitoring of marine megafauna for each survey (single survey), annual (data to date, EP performance report) and final (all data) reports relative to the established baseline condition and the reference sites. • Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) the SM06 Chapter for Annual Reports as specified by the Technical Scope Lead (or delegate) each year and the Marine Megafauna Monitoring Final Report within 8 weeks of field termination. • After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve Final Marine Megafauna Monitoring Report within 3 months of field termination for dissemination.
Regulatory compliance reporting	<ul style="list-style-type: none"> • Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM06 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
Initiation Trigger	<ul style="list-style-type: none"> • SM06 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill and the initiation criteria are triggered. Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Deployment of field personnel and equipment into the field is planned within seven days of receipt of notification. • The ConocoPhillips IMT EUL will make the decision to activate SM06 based on the initiation criteria: <ul style="list-style-type: none"> • Spill trajectory modelling, surveillance or monitoring (OM01 – OM05) predicts contact is possible to marine megafauna populations or any of their habitats of importance for breeding or foraging; or • Monitoring (OM05) has identified contact or an impact to marine megafauna populations as a result of the hydrocarbon spill; or • There are reports or scientific evidence of oiled marine megafauna.
Termination Criteria	<ul style="list-style-type: none"> • The ConocoPhillips IMT EUL will make the decision to terminate this SMP when: <ul style="list-style-type: none"> • There has been no demonstrable evidence of an impact on marine megafauna from the hydrocarbon/chemical spill; or • Impacts have been recorded and quantified, and • Key biological processes (e.g. abundance, distribution, breeding, mortality) are similar to pre-spill or reference sites.

8.7. SM07 Determination of Impact of Hydrocarbon/Chemical Spill on Commercial, Traditional and Recreational Fisheries (and Aquaculture)

Strategy	Description
Monitoring Performance Outcomes	Monitor for hydrocarbon and dispersant content (if used in response) in representative commercial, traditional and recreational fisheries and aquaculture fish species (including shellfish) to assess the physiological impacts to fisheries; seafood quality/safety and the fisheries recovery following a hydrocarbon release.
Methodology	Coordinate sampling. Develop and implement survey and sampling design. Complete checklists. Review and report.
Action Checklist / Procedure	Form 14: SM07 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM07 monitoring program.	<ul style="list-style-type: none"> • Personnel to be sourced from pool of resources under existing contracts. Arrangement in place with vessel service provider. • Arrangement in place with accredited laboratory (e.g., CSIRO) for analysis of fish toxicological samples.
Acquisition and dissemination of existing commercial, traditional and recreational fisheries and aquaculture fish data	<ul style="list-style-type: none"> • Field Operations Coordinator responsible for the acquisition of existing commercial, traditional, and recreational fisheries and aquaculture fish data from various sources to confirm the commercial, traditional and recreational fish species caught in the area. • A baseline of no hydrocarbon contamination has been assumed for this study for recreational, traditional and commercial fishing stock.
Acquisition of data for hydrocarbon monitoring of representative commercial, traditional and recreational fisheries and aquaculture fish species during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release	<ul style="list-style-type: none"> • Collection and analysis of representative commercial, traditional and recreational fisheries and aquaculture fish species at predicted impact and reference sites, to determine the presence and absence of hydrocarbons and dispersant (if used in response), at frequencies prescribed in the SM07 by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. • Where possible, samples will be obtained from commercial catches at point of landing. ConocoPhillips will liaise with the Tasmanian and Victorian Fisheries Authority, other State authorities (if required) and / or AFMA regarding sampling and analysis of commercial fish stock. Field Operations Manager to store/archive field records. • Laboratory analysis of fish samples at accredited laboratory (e.g., CSIRO). CoC to confirm sample collection, transport to appropriate laboratories, and sample receipt notification from the accredited laboratory to confirm arrival of fish samples within holding times. Documents stored / archived at secure site by Field Operations Manager. • Laboratory Analysis Report issued by accredited laboratory with analysis techniques as defined in SM (within 3 weeks of sample collection) and stored / archived by Field Operations Manager. • Field Operations Coordinator to provide a short report for each Survey (within 4 weeks of completion of field survey) to Technical Scope Lead (or delegate) to approve within one week of submission and distribute to Program Manager and other Field Operations Coordinators.

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Monitoring Performance Standards	Measurement Criteria
<p>Revise SM for long-term monitoring phase of hydrocarbon monitoring of representative commercial, traditional and recreational fisheries and aquaculture fish species after the hydrocarbon release and carry out long-term monitoring phase</p>	<ul style="list-style-type: none"> Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase in commercial, traditional and recreational fisheries and aquaculture fish species after cessation of hydrocarbon release. Field Operations Coordinator revises SM for long-term monitoring phase in commercial, traditional and recreational fisheries and aquaculture fish species within 4 weeks after Final Report approval and provides to Technical Scope Lead (or delegate) to approve revision to SM07 for long-term monitoring phase in commercial, traditional and recreational fisheries and aquaculture fish species within 4 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. Field Operations Coordinator responsible for implementation of revised long-term phase SM07.
<p>Assess impact of hydrocarbon release on representative commercial, traditional and recreational fisheries and aquaculture fish species and performance reporting</p>	<ul style="list-style-type: none"> Field Operations Coordinator responsible to assess and to report the monitoring of hydrocarbons and dispersant (if used in response) on representative commercial, traditional and recreational fisheries and aquaculture fish species for each survey (single survey), annual (data to date, EP performance report) and final (all data) report to the established baseline condition and the reference sites for each survey. Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) the SM07 Chapter for Annual Reports as specified by the Technical Scope Lead (or delegate) each year and the Final Report within 8 weeks of field termination. After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve Final Report within 3 months of field termination for dissemination.
<p>Regulatory compliance reporting</p>	<ul style="list-style-type: none"> Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM07 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
<p>Initiation Trigger</p>	<ul style="list-style-type: none"> SM07 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon and/or chemical spill and where the initiation criteria have been triggered. Preparation to deploy field personnel and equipment will commence upon notification from ConocoPhillips IMT that the SMP has been triggered. Deployment of field personnel and equipment into the field are planned within seven days of receipt of notification. The ConocoPhillips IMT Environment Unit Leader will make the decision to activate SM07 based on the initiation criteria: <ul style="list-style-type: none"> Spill trajectory modelling, surveillance or monitoring (OM01 to OM05) predicts contact is possible to species of commercial, recreational, traditional species and or aquaculture importance; or Spill trajectory modelling, surveillance or monitoring (OM01 to OM05) predicts or has reported exposure to known commercial/traditional fishery areas and/or to aquaculture facilities; or Advice has been provided to government to restrict, ban or close a fishery*; or Declarations of intent by commercial fisheries or government agencies to seek compensation for alleged or possible damage. <p>*SM07 will commence to provide data for government to enable decisions to be made on when a fishery can be reopened);</p>

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Monitoring Performance Standards	Measurement Criteria
Termination Criteria	<ul style="list-style-type: none">• Implementation of SM07 should continue until:<ul style="list-style-type: none">• Impacts to commercial and traditional fisheries and aquaculture and recovery have been quantified, and• Contamination in the edible portion or in the stomach/intestinal contents attributable to the spill is no longer detected; or• The physiological and biochemical parameters of commercial, traditional, recreational or aquaculture species are comparable between reference and impact sites; or• Evidence that catch rates, species composition, community abundance, distribution and age structure of commercial fisheries and by-catches have returned to baseline levels (taking into account natural variability).• The ConocoPhillips IMT Environment Unit Leader will make the decision to terminate this SMP when the above criteria are met.

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8.8. SM08 Determination of Impact of Hydrocarbon/Chemical Spill on Recreational, Commercial and/or Industrial Users

Strategy	Description
Monitoring Performance Outcomes	The monitoring performance outcomes for this study is to carry out on monitoring studies to assess socio-economic impacts on recreational, commercial and/or industrial users subsequent recovery pathways following a Level 2/3 hydrocarbon spill.
Methodology	Identify who will be impacted Coordinate assessment by RPS Notify Long term monitoring Complete checklists Review and report
Action Checklist / Procedure	Form 15: SM08 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM08 monitoring program.	<ul style="list-style-type: none"> Personnel to be sourced from pool of resources under existing contracts.
Acquisition and dissemination of existing recreational, commercial and/or industrial users baseline data	<ul style="list-style-type: none"> Field Operations Coordinator responsible for the acquisition of existing recreational, commercial and/or industrial users baseline data from various sources to establish the baseline dataset. Field Operations Coordinator to provide SM08 Monitoring Baseline Data Report (within 8 weeks of hydrocarbon release) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 2 weeks of chapter submission, and to distribute to Program Manager and other Field Operations Coordinators.
Acquisition of data for recreational, commercial and/or industrial users monitoring during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release	<ul style="list-style-type: none"> Collection and analysis of representative socio-economic data at locations and predicted impact and reference sites, at frequencies prescribed in the SM08 by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field Operations Manager to store / archive field records at secure site. Field Operations Coordinator to provide a short data report summarising each field survey within 4 weeks of completion of each field survey to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 1 week of submission and distribute to Program Manager and other Field Operations Coordinators.
Revise SM for long-term monitoring phase of recreational, commercial and/or industrial users recovery and carry out long-term monitoring phase	<ul style="list-style-type: none"> Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of recreational, commercial and/or industrial users after cessation of hydrocarbon release. Field Operations Coordinator revises SM for long-term monitoring phase of recreational, commercial and/or industrial users within 4 weeks after Final Report approval and provides to Technical Scope Lead (or delegate) to approve revision to SM08 for long-term monitoring phase of recreational, commercial and/or industrial users within 4 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. Field Operations Coordinator responsible for implementation of revised long-term phase SM08

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Monitoring Performance Standards	Measurement Criteria
Assess impact of hydrocarbon release on recreational, commercial and/or industrial users and performance reporting	<ul style="list-style-type: none"> • Field Operations Coordinator responsible to assess and to report on monitoring of recreational, commercial and/or industrial users for each survey (single survey), annual (data to date, EP performance report) and final (all data) reports relative to the established baseline condition and the reference sites. • Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) the SM08 Chapter for Annual Reports as specified by the Technical Scope Lead (or delegate) each year and the Final Report within 8 weeks of field termination. • After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve.
Regulatory compliance reporting	<ul style="list-style-type: none"> • Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM08 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
Initiation Trigger	<ul style="list-style-type: none"> • SM08 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill and initiation criteria are triggered. Preparation to deploy monitoring personnel will commence upon notification from ConocoPhillips IMT that SM08 has been triggered. Deployment of personnel is planned within seven days of receipt of notification. • The ConocoPhillips IMT EUL will make the decision to activate SM08 based on the initiation criteria: <ul style="list-style-type: none"> • spill trajectory modelling, surveillance or monitoring (OM01 to 05) predicts impacts from hydrocarbon or chemical spill and/or spill response activities with commercial, recreational and/or industrial users.
Termination Criteria	<ul style="list-style-type: none"> • SM08 will be terminated when: <ul style="list-style-type: none"> • monitoring results have quantified the extent and level of impact and recovery to selected recreational, commercial and/or industrial users; and • monitoring indicates there are no new or additional impacts likely to affect recreational, commercial and/or industrial users; and • areas requiring long term monitoring have been identified and an ongoing monitoring plan developed in consultation with key stakeholders

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8.9. SM09 Determination of Impact of Hydrocarbon/Chemical Spill on Conservation, Heritage or Native Title

Strategy	Description
Monitoring Performance Outcomes	The monitoring performance outcomes for this study is to carry out on monitoring studies to impacts on conservation, heritage and native title importance sites following a Level 2/3 hydrocarbon spill.
Methodology	Identify who will be impacted Coordinate assessment by RPS Notify Long term monitoring Complete checklists Review and report
Action Checklist / Procedure	Form 15: SM08 EUL Action Checklist
Monitoring Performance Standards	Measurement Criteria
Readiness to implement SM09 monitoring program.	<ul style="list-style-type: none"> Field Operations Coordinator responsible for the acquisition of existing conservation, heritage and native title importance site baseline data from various sources to establish the baseline dataset. Field Operations Coordinator to provide SM09 Monitoring Baseline Data Report (within 8 weeks of hydrocarbon release) to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 2 weeks of chapter submission, and to distribute to Program Manager and other Field Operations Coordinators.
Acquisition of data for conservation, heritage and native title importance sites monitoring during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release	<ul style="list-style-type: none"> Collection and analysis of representative socio-economic data at locations and predicted impact and reference sites, at frequencies prescribed in the SM09 by Field Operations Manager during the hydrocarbon release and for 3 months after the cessation of the hydrocarbon release. Field Operations Manager to store / archive field records at secure site. Field Operations Coordinator to provide a short data report summarising each field survey within 4 weeks of completion of each field survey to Technical Scope Lead (or delegate). Technical Scope Lead (or delegate) to approve within 1 week of submission and distribute to Program Manager and other Field Operations Coordinators.
Revise SM for long-term monitoring phase of conservation, heritage and native title importance sites recovery and carry out long-term monitoring phase	<ul style="list-style-type: none"> Field Operations Coordinator to consider final information / results in the revision of the SM for the long-term monitoring phase of conservation, heritage and native title importance sites after cessation of hydrocarbon release. Field Operations Coordinator revises SM for long-term monitoring phase of conservation, heritage and native title importance sites within 4 weeks after Final Report approval and provides to Technical Scope Lead (or delegate) to approve revision to SM08 for long-term monitoring phase conservation, heritage and native title importance sites within 4 weeks of submission after consultation with NOPSEMA and State authorities; and disseminates to Field Operations Manager. Field Operations Coordinator responsible for implementation of revised long-term phase SM09.

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Monitoring Performance Standards	Measurement Criteria
Assess impact of hydrocarbon release on conservation, heritage and native title importance sites and performance reporting	<ul style="list-style-type: none"> • Field Operations Coordinator responsible to assess and to report on monitoring of conservation, heritage and native title importance sites for each survey (single survey), annual (data to date, EP performance report) and final (all data) reports relative to the established baseline condition and the reference sites. • Field Operations Coordinator to prepare and to provide Technical Scope Lead (or delegate) the SM09 Chapter for Annual Reports as specified by the Technical Scope Lead (or delegate) each year and the Final Report within 8 weeks of field termination. • After consultation with NOPSEMA and State authorities, Technical Scope Lead (or delegate) to approve.
Regulatory compliance reporting	<ul style="list-style-type: none"> • Technical Scope Lead (or delegate) to provide regulators (NOPSEMA, State authorities) with the Final SM09 Scientific Monitoring Report within 4 weeks of approval by the Technical Scope Lead (or delegate).
Initiation Trigger	<ul style="list-style-type: none"> • SM09 is to be implemented in the event of a tier 2 or tier 3 hydrocarbon spill and initiation criteria are triggered. Preparation to deploy monitoring personnel will commence upon notification from ConocoPhillips IMT that SM09 has been triggered. Deployment of personnel is planned for within seven days of receipt of notification. • The ConocoPhillips IMT EUL will make the decision to activate SM09 based on the initiation criteria: <ul style="list-style-type: none"> • spill trajectory modelling, surveillance or monitoring (OM01 to 05) predicts impacts from hydrocarbon or chemical spill and/or spill response activities with one or more cultural heritage or Native Title importance (including recorded and unrecorded Aboriginal cultural heritage, material, sites or places, or intangible cultural heritage and/or historically-listed heritage artefacts or places).
Termination Criteria	<ul style="list-style-type: none"> • SM09 will be terminated when: <ul style="list-style-type: none"> • monitoring results have quantified the extent and level of impact and recovery to areas of particular conservation, heritage and Native Title importance; and • monitoring indicates there are no new or additional impacts likely to affect areas of particular conservation, heritage and Native Title importance; and • a health impact assessment determines there are no impacts to human health (where required); and • a Socio-economic Impact Assessment determines there is no impact to conservation, heritage and Native Title values; and • recovery of any affected sites has been demonstrated in two consecutive years of scientific monitoring data.

9. Resource Requirements

The resources required to implement OMs and SMs are provided in each plan. The approach to determining resource requirements was designed to be scalable to the nature and scale of a spill throughout an evolving incident. Personnel resources, vehicles/vessels and equipment are defined for a ‘survey unit’. A survey unit represents the resources required to undertake monitoring at one location for one shift for one OM/SM scope. Survey units can therefore be multiplied to meet monitoring requirements.

When calculating personnel resource requirements, the following should be considered:

- Shifts – which aspects require consideration of multiple shifts per 24-hour period (e.g. office-based personnel during the response phase, offshore vessel surveys) to optimise response? Calculations of personnel resource requirements for these aspects should include a multiplier of survey unit requirements based on the number of shifts per 24-hour period. Note: RPS field personnel to only work in daylight hours.
- Personnel rotations – fatigue management is a critical aspect of ongoing maintenance of response operations. Therefore the personnel resource pool should be large enough to accommodate complete replacement of response personnel every rotational period (the maximum period of time a person will be in a role before being rotated out for a period of leave). For example, the rotational period for field personnel on offshore vessels should be no more than 3 weeks. Should offshore vessel endurance be shorter than this, i.e. they require return to port for fuel/victualling earlier than 3 weeks, personnel rotational periods on these vessels must be based on vessel endurance. Note: RPS personnel must not work for longer than 12-hrs per shift and must allow a minimum of 10-hours off work in between each shift

9.1. Equipment

Indicative equipment requirements and recommendations are listed in the individual OMs and SMs. Situational, suitability and availability factors may affect the actual equipment selected for each monitoring plan, but the selected equipment will be suitable to achieve the objectives of the plans. In accordance with cost-recovery arrangements within the OSMP services contract, RPS will provide, or identify suitable subcontractors to provide, all specialised field monitoring equipment to implement relevant OMs and SMs at the direction of ConocoPhillips. ConocoPhillips will remain responsible for support and field logistics, including monitoring platforms (e.g. vessels, vehicles and aircraft), flights and accommodation for personnel and transportation/couriers for samples to be sent back to laboratories.

9.2. Personnel

9.2.1. Competencies

Training and experience requirements for key RPS OSMP roles are defined in Table 9-1.

Table 9-1: Key OSMP roles and competencies

Roles	Competencies
RPS OSMP Program Manager (OSM Service Provider)	<ul style="list-style-type: none"> • Bachelor’s degree in environmental management/science from a recognised institution or equivalent tertiary study in technical area • > 10 years’ experience in environmental management • PMAOMIR320 or PMAOMIR322 – Manage Incident Response Information; or ICS 100 and ICS 200; or IMO2 Oil Spill Management Course or similar accredited course • Participation in one incident management exercise every two years • Operational and Scientific Monitoring Plan Awareness Training
RPS OSMP technical scope leads (OSM Service Provider)	<ul style="list-style-type: none"> • Bachelor’s degree in environmental management/science from a recognised institution or equivalent tertiary study in technical area • > 10 years’ experience in environmental management • PMAOMIR320 or PMAOMIR322 – Manage Incident Response Information; or ICS 100 and ICS 200; or IMO2 Oil Spill Management Course or similar accredited course • Participation in one incident management exercise per year

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Roles	Competencies
	<ul style="list-style-type: none"> Operational and Scientific Monitoring Plan Awareness Training, including understanding of how to activate external OSM providers
OSMP Field Operations Coordinator (OSM Service Provider)	<ul style="list-style-type: none"> Bachelor’s degree in environmental management/science from a recognised institution or equivalent tertiary study in technical area > 5 years’ experience in environmental management PMAOMIR320 or PMAOMIR322 – Manage Incident Response Information; or ICS 100 and ICS 200; or IMO2 Oil Spill Management Course or similar accredited course Participation in one incident management exercise per year Operational and Scientific Monitoring Plan Awareness Training Working knowledge of processes to engage additional support contracts and personnel (if required)
OSMP Field Teams (OSM Service Provider)	Refer to OMPs and SMPs.

9.2.2. Response Testing

The purpose of testing is to confirm that the response arrangements and capabilities in place are available when needed and function as intended. As part of the exercise process, ConocoPhillips Australia prepares a number of documents to ensure drills and exercises are well planned and evaluated, and routinely undertakes post-exercise debriefings following Level 2-3 exercises and drills to identify opportunities for improvement and communicate lessons learned (refer to the OPEP for detailed operational readiness).

Actions that are derived from drills and exercises including debriefs are documented in an action tracking system.

10. Health, Safety, Security, Environment and Quality (HSSEQ)

It is essential that the normal safety practices that ConocoPhillips personnel follow in their regular activities apply throughout the entire life of a spill response. Additional safety measures may need to be implemented to provide additional risk mitigation to protect survey personnel from the risks associated with spill response activities.

Service providers contracted to provide monitoring/standby services in relation to this OSMP, OMPs and SMPs will be pre-qualified and vetted according to their scope in line with ABU functional processes including:

- HSE Pre/Qualification. A specific HSE plan may be required based on the risk and operational control designation and will be determined by the HSE Supervisor CMER & Contractor Management.
- Marine (vessel vetting and approval)
- Emergency Response

Standard HSE requirements will be detailed in the scope of work specific to each service provider, but will include as a minimum risk assessment, Hazard Identification (HAZID) and Job Hazard Analysis (JHA). RPS personnel must not work for longer than 12-hrs per shift and must allow a minimum of 10-hours off work in between each shift.

10.1. Quality Control and Quality Assurance

Standard quality assurance (QA) and quality control (QC) procedures are to be followed to ensure high quality data is collected.

The following QA/QC procedures are to be followed during collection of field samples:

- Field staff appropriately trained and supervised.
- Appropriate use and maintenance of sampling equipment, and calibration procedures.
- Sampling techniques in accordance with relevant guidelines and standards (e.g. AS/NZS 5667.1:1998).
- Sample containers accurately labelled and log of collected samples maintained and updated.
- Chain of custody forms maintained and included with samples, and copies retained; and
- Correct sample preservation and handling procedures followed.

For biological surveys QA/QC procedures will be used to objectively remove any photographic/ video images that are not suitable for analysis (e.g. images that are blurred, smudged, out of focus, under-/overexposed or otherwise of poor quality).

10.1.1. Quality Control Samples

To check for potential contamination of water and sediment samples, the following QC samples should be considered:

- Intra-laboratory duplicates (to check for repeatability of laboratory analysis methods - additional samples supplied for identical analysis to a single laboratory from)
- Triplicate sample for Inter-laboratory testing (to check for consistency of analytical methods between laboratories)
- Field blanks (to check for contamination when collecting the sample)
- Transport/trip blanks (to check for contamination during storage and transport of samples)
- Equipment blanks (to check for contamination from sampling equipment)
- Spike recovery (to check for recovery of spiked sample by laboratory)

Requirements for QC samples will be relevant to the OSMP scope and discussed with analytical laboratories prior to mobilisation.

10.2. Data Transfer and Management

10.2.1. Field

Field observations will be recorded on data sheets during monitoring. Information will be recorded on the data sheet, including:

- Date and time of sampling
- Sample site reference code/number
- Digital filenames (or name-number range)
- GPS position or fix number
- Species/life-stage (age)/behaviour/health/condition (where relevant)
- Hydrocarbon exposure / odours / visible signs
- Weather conditions
- Tides
- Person responsible
- Additional comments.

Summaries of surveys conducted for all locations will be included in standard daily field reports from field teams to the ConocoPhillips Australia EUL.

10.2.2. Positioning

Positioning of sampling locations is to be recorded using a Global Positioning System (GPS) instrument. All spatial information is to be recorded in the correct format for the datum selected (e.g. DD° MM' SS.SS" using the WGS84 datum).

10.2.3. Storages

Field data sheets should be retained and checked to ensure they are complete, and that writing is clearly legible. Information transcribed from field data sheets into electronic format should be checked for accuracy and completeness and field data sheets should be scanned for digital storage.

Digital field data (e.g. instrument, video, photographs and GPS positions) should be downloaded from instruments as soon as practicable, backed up onto independent storage media (e.g. USB drives) and checked to assess the quality of the data (check for unreasonable or inconsistent results).

Written field data should be entered into digital format at least daily (e.g. transcribed into spread sheets, hard copies scanned) and backed up onto independent storage media (e.g. USB drives). All written data sheets should be stored securely. All data in digital format should be transferred for additional data security where practicable (e.g. to ConocoPhillips office for storage on network drives where communications allow, or on to back up storage media).

All monitoring data is to be stored electronically in a suitable format (e.g. Microsoft Excel). A backup of all data is to be stored separately. All QA/QC data is to be stored with the monitoring data. All datasets will be accompanied by a metadata summary. All data analysis should be undertaken on copies of original data, with the original data unaltered.

GIS data, such as modelling output tables and shapefiles, time varying oceanographic and meteorological parameters (e.g. three-dimensional current fields, temperature, wind fields) and simulated spill trajectories will follow standard accepted data formats including PPT, DOC, JPG, AVI, SHP and KMZ formats, to maximise interoperability between modelling and visualisations systems. Standardised data formats will provide efficiencies in automated data quality control and archiving systems. Archiving of both input data and simulated trajectories and fates of spilled hydrocarbons and/or other chemicals is critical for post incident performance analysis and potential forensic analysis of spill response procedure.

10.2.3.1. Analysis

All analyses should be carried out on a duplicate data set; original monitoring data should not be altered during the analysis. Upon receiving data and/or analytical results from a laboratory, the data/results should

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be reviewed for outliers and an assessment of the quality of the assessment/analysis made by a competent scientist.

Digital files, e.g. spill trajectory modelling output, will be checked by the EUL against the transmittal summary to ensure the files listed have been received. Files will be saved and backed up in the office and will be checked to ensure the backup has been successful, the backup files are not corrupt and can be opened.

10.2.4. Reporting and Close-out

Regular reporting is to be undertaken and provided to the ConocoPhillips Australia EUL, or designated OSMP Lead, including but not limited to:

- Weekly, monthly, quarterly, 6-monthly and/or annually for medium-long term programs, depending on the nature, magnitude and extend of the release and resultant environmental impact; and
- All sampling data and data interpretation provided in spatial data format (e.g. shape file) and Microsoft Excel spreadsheets as appropriate for use by other OMPs and SMPs.

Any OMPs implemented during a response will have simple reporting requirements (e.g. activities undertaken, HES performance and survey progress). Reports will need be sent through to the IMT on a daily basis (or more frequently as requested by the IMT). OMP reporting will not be peer reviewed. No final reporting is required for OMPs. However, information from OMPs may feed into certain SMP draft and final reports as appropriate. All sampling data and data interpretation provided in spatial data format (e.g. shape file) and/or spreadsheets as appropriate.

Technical survey reports detailing whether the termination criteria have been reached, including recommendations for future monitoring. Where possible, reports will compare monitoring results for hydrocarbons/chemicals against reference/baseline data or benchmark levels. Reporting should also include the spatial assessment of the distribution of hydrocarbons/chemicals over time. Where possible, reporting should also include an assessment of the performance of the response options against the monitoring performance outcomes in the OSMP.

Draft technical survey reports for SMPs will be peer reviewed by an expert panel to be approved by the Commonwealth DCCEE and/ DNRE (TAS) and DEECA (VIC), as appropriate. Comments from peer reviews will be addressed when finalising SMP reports. Scientific monitoring data and reports shall be reviewed by the RPS OSM Implementation Lead prior to being submitted to the Titleholder's nominated representative.

Reports should document whether the termination criteria have been reached and make recommendations on the requirements of future monitoring. Comparison with relevant guidelines and baseline data is to be included in all reports, with the exception of daily reports. Further guidance on relevant guidelines and baseline data is provided in individual OMPs and SMPs.

11. Plan Review and Continuous Improvement

The OSMP will be reviewed as part of ConocoPhillips' policy of continuous review and improvement:

- Following the oil spill exercises and testing
- After an actual oil spill into the marine environment
- If the oil spill risk profile changes significantly, and
- If changes to Commonwealth and state oil spill response plans or resources occur that affect ConocoPhillips Australia's ability to effectively implement and comply with the OSMP.

Review of the OSMP will consider the following:

- OSMP sampling methods - the identification of available new technologies or methods may trigger a revision of individual monitoring plans should they be considered appropriate to the objectives of the OSMP, scientifically robust, and are likely to be of benefit to OSMP outcomes.
- Review of available baseline data may also trigger a revision of OSMP documentation should sampling methods be identified that are not described in relevant Operational Monitoring Plans (OMPs) or Scientific Monitoring Plans (SMPs).
- All record keeping, including communication, schedules, CoCs, daily reports, HSE/incident reports, signed plans, field survey logbooks, and field datasheets are to be subject to the QA/QC process, then summarised (where necessary), digitised and archived. The continuous Lessons Learned and improvement processes will be a key component of OSMP outcomes.

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[https://epa.tas.gov.au/about-the-epa/policy-legislation-cooperative-arrangements/cooperative-arrangements/marine-oil-and-chemical-spills/tasmanian-marine-oil-spill-contingency-plan-\(tasplan\)](https://epa.tas.gov.au/about-the-epa/policy-legislation-cooperative-arrangements/cooperative-arrangements/marine-oil-and-chemical-spills/tasmanian-marine-oil-spill-contingency-plan-(tasplan))

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<https://www.nopsema.gov.au/sites/default/files/documents/2021-03/A343826.pdf>

Parks Australia (2013). South-east Commonwealth Marine Reserves Network Management Plan. Online

access: <https://parksaustralia.gov.au/marine/parks/south-east/>

Operational and Scientific Monitoring Program

Appendix 1. EUL Action Checklists

Form 1: OM01 EUL Action Checklist		
SPILL TRAJECTORY PREDICTION AND ASSESSMENT OF RECEPTORS AT RISK		
Action	Item	Check
Coordinate trajectory modelling by RPS	Contact RPS Duty Officer on mobile: 0408 477 195 (24/7) and by Email: response@apasa.com.au (details in Emergency Contacts Directory) (backup: AMSA form)	<input type="checkbox"/>
	Complete and submit OM01 Procedure for Initiating Spill Modelling (HERE) and provide context in cover email e.g., <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">Commence OSTM 6, 12, 24 hour predictions for sea-surface/entrained/dissolved oiling and time to/location of shoreline contact for release of _____ m³ of _____ (hydrocarbon) from location: Long/Lat: _____, under the following conditions (instantaneous, ongoing, rate of release, weather, sea-state, hydrocarbon assay, etc)</div>	<input type="checkbox"/>
	Request Supply Unit Leader to execute the modelling service provider contract (ICS 213-RR)	<input type="checkbox"/>
Prepare for RPS information request	Collate accurate current, wind, temperature (air and sea), precipitation and tide data: <ul style="list-style-type: none"> windy.com http://www.bom.gov.au/tas/forecasts/bassstrait.shtml http://www.bom.gov.au/oceanography/forecasts/idvoc300.shtml?region=VICTAS&forecast=SSTCur http://oceancurrent.imos.org.au/tides/ https://maps.tidetech.org/?layer=ocean_current_speed_direction 	<input type="checkbox"/>
	Calculate/estimate the spill volume (use link for guide to Quantifying the Volume of a Spill).	<input type="checkbox"/>
	Observe and determine the spill trajectory (manual plotting), noting the speed and direction of the spill. Please use link for guide to Manually Calculating a Spills Trajectory .	<input type="checkbox"/>
	Locate detailed bathymetric data covering the potential contact region (see EP Figure 4-20; CoastKit) to indicate locations of intertidal zones and other sensitive receptors.	<input type="checkbox"/>
	Collate details of any response strategies applied to the spill, including the use of dispersant	<input type="checkbox"/>
Undertake ADIOS modelling	If not already installed on laptop, open/download ADIOS: ADIOS response.restoration.noaa.gov Follow instruction to build spill scenario using MDO, wind, wave, current conditions and water temperature from https://www.windy.com/ and release conditions. Solve and send to SITL for display.	<input type="checkbox"/>
Access Tracking Buoy Data	Request AMOSC to provide access to Satellite Buoy Tracking Data.	<input type="checkbox"/>
Prepare update requests	Complete requests for modelling update form as conditions change (HERE) and submit to RPS by Email: response@apasa.com.au	<input type="checkbox"/>
Receive model output and report	Ensure model output is available within five hours , and will be updated at least twice every operational day during the spill response	<input type="checkbox"/>
	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>
	Provide IMT Planning Section Chief with OM01 updates (modelling reports)	<input type="checkbox"/>

Operational and Scientific Monitoring Program

Form 2: OM01 Procedure for Initiating Spill Modelling



PROCEDURE FOR INITIATING SPILL MODELLING – FOR OIL SPILLS

- Step 1.** Complete the form with all details – provide estimates and details of uncertainties.
- Step 2.** Call the RPS Response duty officer on **(+61 408 477196)** to alert them of the requirement for spill modelling, explaining the general details and seeking clarification as required.
- Step 3.** Send the form to **RPSresponse@rpsgroup.com** (save form as pdf, then click on the email address (in this step), attach your saved form and your attachments (listed below), to your email and send).

Incident Exercise Clear form

Date and time of this notification: (HH:MM)

Contact details

Name of company	<input type="text"/>
Name of contact person	<input type="text"/>
Contact number (include country/area codes)	<input type="text"/>
Email address for return communications	<input type="text"/>

Details of spilled material (include oil assay if available)

Oil name	<input type="text"/>		
Type or description	<input type="text"/>		
Latitude of source	Degrees: <input type="text"/>	Minutes: <input type="text"/>	Seconds: <input type="text"/>
Longitude of source	Degrees: <input type="text"/>	Minutes: <input type="text"/>	Seconds: <input type="text"/>
Date and time spill started	<input type="text"/>		
Time zone (+ or - from UTC)	<input type="text"/>		
If slicks have been observed from an unknown source, provide map information to define the bounds (attach to email).			
Do you want: Forecasting forward in time from this location or back-track to an unknown source, or both?	<input type="checkbox"/> Forward from slick area	Geographic bounds of slick area(s) and time of observation must be supplied	
	<input type="checkbox"/> Back-track from slick area		
	<input type="checkbox"/> Forward and back-track		

Depth, type of discharge

Depth of release	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface – specify the depth (m)
If from subsurface, describe the discharge energy	<input type="checkbox"/> Low turbulence e.g. low-pressure leak	
	<input type="checkbox"/> Medium turbulence e.g. intermediate-pressure leak	
	<input type="checkbox"/> High turbulence e.g. well blow out, ruptured pipeline	

Volume or rate of release

Short spills that have ended	Volume: <input type="text"/>	Units: <input type="text"/>	Duration (hours): <input type="text"/>
Ongoing spills	Rate: <input type="text"/>	Units: <input type="text"/>	per hour

Notes (describe special details of the incident, special concerns, landmarks, doubts about information, etc.)

Documents attached

- Oil Assay sheet
 Safety data sheet
 Local wind measurements
 Spill site photos
 Aerial surveillance maps
 Line drawings showing oil distribution
 Others (specify):

Oil spill response.docx

Page 1

PROCEDURE FOR REQUESTING UPDATED OIL SPILL MODELLING

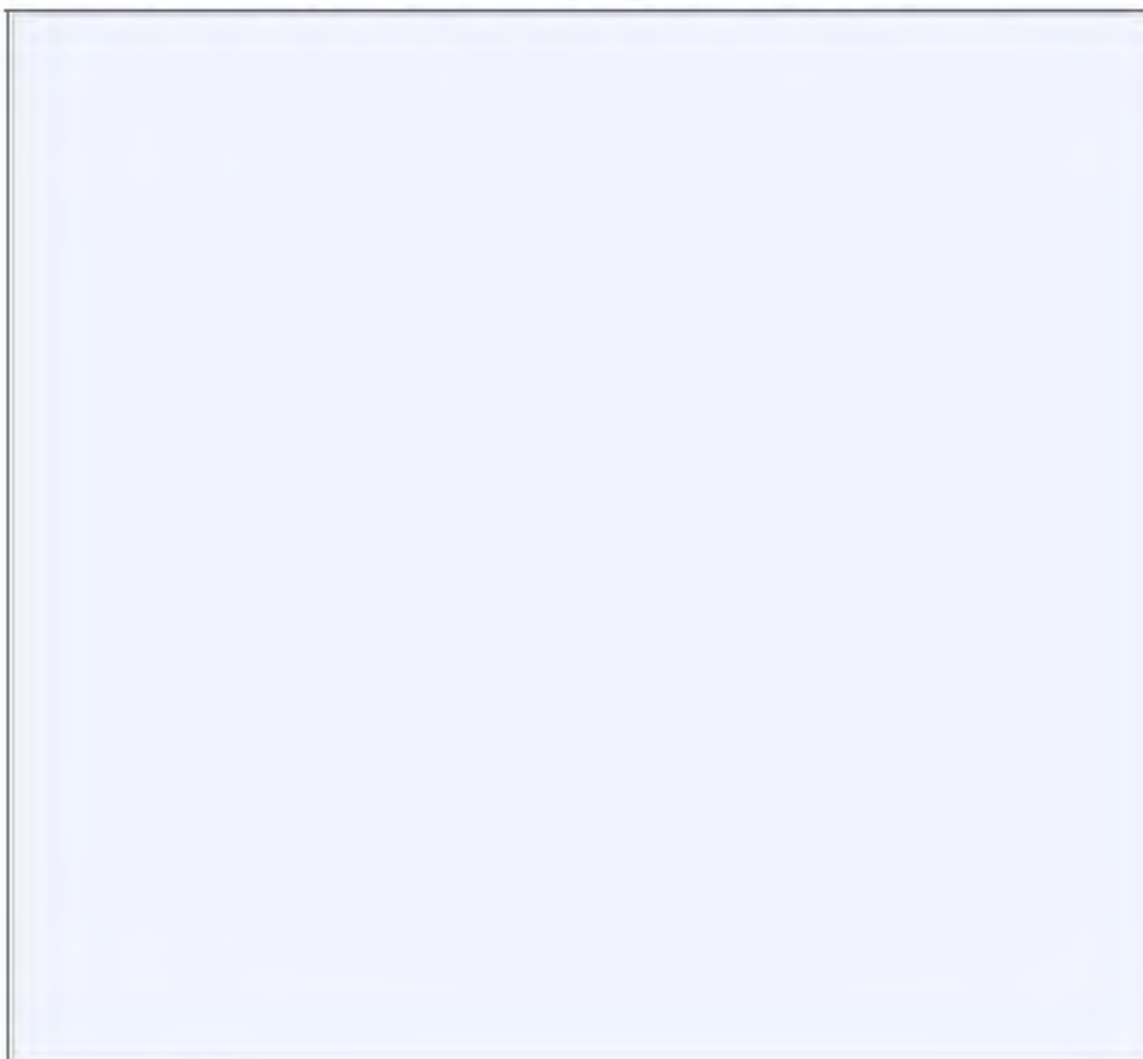
Step 1. Revise the input form for any changes.

Step 2. If surveillance is available to define the observed location of slicks, this information should be provided to the duty officer in a format that can be translated to define the spatial distribution and relative thickness of the oil. Formats that would be useful include:

- a. A GIS (.shp) file defining the oil distribution (including the datum format)
- b. Satellite imagery that includes spatial references
- c. Photographs with location references
- d. A line drawing marked with estimated centre and edge locations, length and width dimensions, and relative thickness contours (use the space below, making sure to provide spatial references)
- e. Location of tracking buoys (first confirm that these are marking the slick location).

Step 3. Call the RPS Response duty officer on **(0408 477196)** to request an update to the spill modelling for changed details, explaining what has changed and seeking clarification as required.


Step 4. Send the form and any files to **RPSresponse@rpsgroup.com** (click on email address).




Operational and Scientific Monitoring Program

Form 3: OM02 EUL Action Checklist

SPILL SURVEILLANCE AND RECONNAISSANCE TO DETECT RECEPTORS AT RISK

Action	Item	Check
Coordinate aerial surveillance by AMOSC	Support Operations Section Chief to contact AMOSC on telephone: (03) 5272 1555 (office), mobile: 0438 379 328 (24/7), fax: (03) 5272 1839 or email: amosc@amosc.com.au (details in Emergency Contacts Directory) to activate Aerial Surveillance and provide context e.g., Commence aerial surveillance for sea-surface/entrained oiling and shoreline contact for release of _____m ³ of _____ (hydrocarbon) from location: Long/Lat: _____, under the following conditions (instantaneous, ongoing, rate of release, weather, sea-state, hydrocarbon assay, etc). Continue daily surveillance for minimum 3 days post-release. Report wildlife observations as soon as possible and visual observations of plume at least daily (<1600hrs) to RPS, EUL and SITL.	<input type="checkbox"/>
	Request Supply Unit Leader to complete a signed service contract by a call out authority and submit to AMOSC to allow mobilisation (ICS 213-RR)	<input type="checkbox"/>
Consider access to satellite data from AMOSC/ OSRL	Support Operations Section Chief to contact AMOSC on telephone: (03) 5272 1555 (office), mobile: 0438 379 328 (24/7), fax: (03) 5272 1839 or email: amosc@amosc.com.au (details in Emergency Contacts Directory) to activate Satellite Imagery data collection	
	If needed, contact OSRL Duty Officer on telephone: +65 6266 1566 (24/7), fax: +65 6266 2312, or email: dutymanagers@oilspillresponse.com	<input type="checkbox"/>
	Download, complete and submit OSRL Notification Form	<input type="checkbox"/>
	Request Supply Unit Leader to put in place an OSRL service contract (ICS 213-RR)	<input type="checkbox"/>
Consider activation of vessel surveillance by RPS	Consider activation of RPS vessel surveillance to monitor the initial event and undertake observations for wildlife  CAUTION: Vessel surveillance may not be suitable for volatile hydrocarbons due to safety concerns.	<input type="checkbox"/>
	Request Supply Unit Leader to execute RPS OSMP service contract and submit to RPS to allow mobilisation, if appropriate (ICS 213-RR); or request support from vessel(s) on scene	<input type="checkbox"/>
OM02 Checklists	Provide guidance to service provider: - OM02 Pre-mobilisation Checklist - OM02 Work Platform Checklist - OM02 Equipment Checklist	<input type="checkbox"/>
Report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>
	Provide IMT Planning Section Chief with OM02 updates (daily surveillance reports)	<input type="checkbox"/>
	Provide RPS with OM02 updates (daily surveillance reports) for OSTM validation	<input type="checkbox"/>
	Obtain final aerial, satellite and/or vessel surveillance report following termination of OM02	<input type="checkbox"/>

Operational and Scientific Monitoring Program

Form 4: OM03 EUL Action Checklist											
HYDROCARBON PROPERTIES, BEHAVIOURS AND WEATHERING AT SEA											
Action	Item	Check									
Coordinate sampling by RPS	Contact the designated RPS OSMP Program Manager within 2 hours following notification of Level 2/3 spill	<input type="checkbox"/>									
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>[REDACTED]</td> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> <tr> <td>[REDACTED]</td> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> </tbody> </table>	RPS Program manager*	Contact details	Status	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
	RPS Program manager*	Contact details	Status								
	[REDACTED]	[REDACTED]	[REDACTED]								
	[REDACTED]	[REDACTED]	[REDACTED]								
	<i>*During periods of leave/absence alternative contact details will be provided.</i>										
	Provide the following information to RPS Program Manager <ul style="list-style-type: none"> The nature and scale of the spill location when the incident took place details of the hydrocarbon released (type and estimated release volume) OMPs/SMPs that must be activated (as directed by the Control Agency) Other relevant situational awareness information. 	<input type="checkbox"/>									
	Refer to PART A of OSMP for operational direction for activating and implementing an OSMP response	<input type="checkbox"/>									
	Consider activation of vessel based sampling to sample the initial event	<input type="checkbox"/>									
	<div style="border: 2px solid yellow; padding: 5px; display: inline-block;">  CAUTION: Vessel based sampling may not be suitable for volatile hydrocarbons due to safety concerns. </div>										
	Request Supply Unit Leader to execute RPS OSMP service contract and submit to RPS to allow mobilisation, if appropriate (ICS 213-RR)	<input type="checkbox"/>									
	If required, request Supply Unit Leader to organise hire and delivery of hydrocarbon Fluorometer, YSI sonde multi-probe with refined fuels sensor and fDOM sensor for coastal monitoring, or interface meters from e.g. Airmet on 1300 137 067, Xylem Analytics on 1300 995 362 (or other supplier), where available	<input type="checkbox"/>									
OM03 Checklists	Provide guidance to service provider: <ul style="list-style-type: none"> OM03 Pre-mobilisation Checklist OM03 Work Platform Checklist OM03 Equipment Checklist OM03 Sampling Procedure Checklist OM03 Pre-populated Chain of Custody 	<input type="checkbox"/>									
Review and Report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>									
	Provide IMT Planning Section Chief with OM03 updates (daily field data and reports and analytical reports as available)	<input type="checkbox"/>									
	Review results to determine ongoing monitoring requirements (typically expected to decrease over time)	<input type="checkbox"/>									
	Provide RPS with OM03 updates (daily field reports)	<input type="checkbox"/>									
	Obtain final sampling report following termination of OM03	<input type="checkbox"/>									

Operational and Scientific Monitoring Program

Form 5: OM04 EUL Action Checklist		
PRE-EMPTIVE ASSESSMENT OF RECEPTORS AT RISK		
Action	Item	Check
Compile ENV/SE/CH Baseline data	Review output from OM01 and sensitive receptors in mapping in IAP	<input type="checkbox"/>
	Review EP, OPEP and OSMP information on receptor presence, distribution and sensitivity to hydrocarbons (surface and entrained) and response activities, and investigate and include information from any new sources of data, e.g. research studies	<input type="checkbox"/>
	Review Tables 6-2 to 6-10 for resources at risk and sensitivities	<input type="checkbox"/>
Validate available information	Confirm species presence (including seasonality) and distribution	<input type="checkbox"/>
	Request Public Information Officer and Liaison Officer to consult with The Australian Fisheries Management Authority , Victorian Fisheries Authority , fishing Tasmania and Department of Natural Resources and Environment Tasmania regarding active fisheries within the EMBA where samples may need to be collected (from Vessel Monitoring Systems data (VMS)) and seek their involvement where appropriate regarding active fisheries within the EMBA	<input type="checkbox"/>
Compile overlays and assess information	Overlay spill trajectory data (OM01); surveillance data (OM02); and behaviour and weathering data (OM03) as it becomes available on Resources at Risk Maps to confirm where sensitive receptors are located in relation to known spill extent and predicted trajectory	<input type="checkbox"/>
	Update ICS 232 – Resources at Risk	<input type="checkbox"/>
	Use information on predicted (OM01) and observed (OM02) state of hydrocarbon at time of exposure to assess potential impact (thresholds of impact)	<input type="checkbox"/>
	Identify priority protection areas to support spill response activities	<input type="checkbox"/>
	Interpret logistical information (e.g. access) from maps and surveillance data (OM02), that may assist in understanding the feasibility of certain response activities (e.g. shoreline protection or clean-up along inaccessible sections of coastline)	<input type="checkbox"/>
	Identify key information gaps and address, where possible	<input type="checkbox"/>
Review and Report	Update map collating hydrocarbon spill trajectory modelling (OM01), surveillance data (OM02) and behaviour and weathering (OM03) overlaid on Resources at Risk Map when new information becomes available.	<input type="checkbox"/>
	Support Control Agency NEBA or lead OEDP NEBA (with OSC, PUL, PIO and others as relevant) as new information becomes available to confirm ongoing feasibility and effectiveness of response options and document decisions (print NEBA to PDF) and in ICS 214a – Individual Log	<input type="checkbox"/>
	Track the presence and distribution of sensitive receptors within the trajectory of the spill and/or exposed to the spill, response activities, and OMs and SMs triggered.	<input type="checkbox"/>
	Provide IMT Planning Section Chief with OM04 updates as available	<input type="checkbox"/>

Operational and Scientific Monitoring Program

Form 6: OM05 EUL Action Checklist		
OPERATIONAL MONITORING OF CONTAMINATED SENSITIVE RECEPTORS		
Action	Item	Check
Coordinate reconnaissance surveys	Coordinate low-tide aerial reconnaissance survey using AMOSC - telephone: (03) 5272 1555 (office), mobile: 0438 379 328 (24/7), fax: (03) 5272 1839 or email: amosc@amosc.com.au (details in Emergency Contacts Directory), where possible	<input type="checkbox"/>
	Alternatively, coordinate low-tide aerial reconnaissance survey using Helicopter Charter or UAV service provider	<input type="checkbox"/>
	If aerial surveys are not possible, coordinate rapid shoreline assessment (SCAT) from vessels or by teams on foot (see below)	<input type="checkbox"/>
Delineate shoreline sectors and segments - Refer to OSRL SCAT Field Guide	Based on observations from reconnaissance survey, divide affected areas into SECTORS (based on access points and logistics). <ul style="list-style-type: none"> - LISTMAP for King Island and King Island First Strike Plan Segments - CoastKit (Victorian Department of Energy, Environment and Climate Action mapping service) 	<input type="checkbox"/>
	Within each sector establish SEGMENTS - discrete lengths of shoreline with relatively uniform physical features and sediment type – where hydrocarbons will behave similarly. Size segment boundaries appropriately to the spill conditions and the total area of impact (often 0.2 to 2.0 km long)	<input type="checkbox"/>
Coordinate SCAT and OWR support	Coordinate with Control Agencies, RPS OSMP Program Manager and support from below:	<input type="checkbox"/>
	Contact AMOSC on telephone: (03) 5272 1555 (office), mobile: 0438 379 328 (24/7), fax: (03) 5272 1839 or email: amosc@amosc.com.au - SCAT and OWR (equipment in Geelong and can coordinate support from EPA-Tas + equipment in Devonport)	<input type="checkbox"/>
	If needed, contact OSRL Duty Officer on telephone: +65 6266 1566 (24/7), fax: +65 6266 2312, or email: dutymanagers@oilspillresponse.com - SCAT Team Leaders	<input type="checkbox"/>
	Confirm Supply Unit Leader has executed RPS and AMOSC service contracts/call out orders and put in place OSRL service contract if needed	<input type="checkbox"/>
Liaise with Regulators to confirm oiled wildlife response	Liaise with AMSA to confirm arrangements for oiled wildlife in Commonwealth waters Wildlife Emergencies: 136186; Whale and Dolphin Emergency Hotline: 1300 136 017.	<input type="checkbox"/>
	Liaise with Victorian Department of Energy, Environment and Climate Action (DEECA) to confirm arrangements for oiled wildlife – Wildlife Emergencies: 136186; Whale and Dolphin Emergency Hotline: 1300 136 017.	<input type="checkbox"/>
	Liaise with EPA Tasmania (Wildlife Division Commander) to confirm arrangements for oiled wildlife (WildPlan)	<input type="checkbox"/>
OM05 Checklists	Provide guidance to service provider: <ul style="list-style-type: none"> - OM05 Work Platform Checklist - OM05 Survey Equipment Checklist - OM05 Survey Observation Checklist - OM05 Shoreline Oiling Summary (SCAT Form) 	<input type="checkbox"/>
Review and Report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>
	Provide IMT Planning Section Chief with OM05 updates (OWR and SCAT reports as available)	<input type="checkbox"/>
	Review survey reports to determine ongoing requirements and SM activations	<input type="checkbox"/>
	Obtain final survey reports following termination of OM05	<input type="checkbox"/>


Operational and Scientific Monitoring Program

Form 7: OM06 EUL Action Checklist (see OM01)		
AIR QUALITY MODELLING (RESPONDER HEALTH AND SAFETY) SCIENTIFIC MONITORING		
Action	Item	Check
Coordinate trajectory modelling by RPS	Contact RPS Duty Officer on mobile: 0408 477 195 (24/7) and by Email: response@apasa.com.au (details in Emergency Contacts Directory) (backup: AMSA form)	<input type="checkbox"/>
	Complete and submit OM01 Procedure for Initiating Spill Modelling (HERE) and provide context in cover email e.g., <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> Commence AQTM 6, 12, 24 hour predictions for VOC's and LEL and for release of _____ m³ of _____ (hydrocarbon) from location: Long/Lat: _____, under the following conditions (instantaneous, ongoing, rate of release, weather, sea-state, hydrocarbon assay, etc) </div>	<input type="checkbox"/>
	Request Supply Unit Leader to execute the modelling service provider contract (ICS 213-RR)	<input type="checkbox"/>
Prepare for RPS information request	Collate accurate current, wind, temperature (air and sea), precipitation and tide data: <ul style="list-style-type: none"> • windy.com • http://www.bom.gov.au/tas/forecasts/bassstrait.shtml • http://www.bom.gov.au/oceanography/forecasts/idyoc300.shtml?region=VICTAS&forecast=SSTCur • http://oceancurrent.imos.org.au/tides/ • https://maps.tidetech.org/?layer=ocean_current_speed_direction 	<input type="checkbox"/>
	Calculate/estimate the spill volume (see OM01)	<input type="checkbox"/>
	Collection of field data <ul style="list-style-type: none"> • Direction, concentration, movement and persistence of VOCs, • The effect of any potential changes in discharge rate and prevailing environmental conditions to the hazardous zones; and • The geographical extent of the lower explosive limit (LEL). 	
	Observe and determine the spill trajectory (manual plotting), noting the speed and direction of the spill (see OM01).	<input type="checkbox"/>
	Collate details of any response strategies applied to the spill, including the use of dispersant (see OM01).	<input type="checkbox"/>
Prepare update requests	Complete requests for modelling update form as conditions change (HERE) and submit to RPS by Email: response@apasa.com.au	<input type="checkbox"/>
Receive model output and report	Provide air quality trajectory modelling (AQTM) results within 5 hours of information provision, and will be updated at least twice every operational day during the spill response.	<input type="checkbox"/>
	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>
	Provide IMT Planning Section Chief with OM06 updates (modelling reports)	<input type="checkbox"/>

Operational and Scientific Monitoring Program

Form 8: SM01 EUL Action Checklist


MARINE WATERS

Action	Item	Check								
Coordinate sampling by RPS	Liaise with RPS OSMP Program Manager and activate SM01 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>								
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> </tbody> </table> <p><i>*During periods of leave/absence alternative contact details will be provided.</i></p>	RPS Program manager*	Contact details	Status	██████████	██████████ ██████████ ██████████	██████████	██████████	██████████ ██████████ ██████████	██████████
RPS Program manager*	Contact details	Status								
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██████████	██████████ ██████████ ██████████	██████████								
	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>								
	If required, request Supply Unit Leader to organise hire and delivery of hydrocarbon Fluorometer, YSI sonde multi-probe with refined fuels sensor and fDOM sensor for coastal monitoring, or interface meters from e.g. Airmet on 1300 137 067, Xylem Analytics on 1300 995 362 (or other supplier), where available	<input type="checkbox"/>								
Develop and implement sampling design	Review OM01, OM02 and OM03 output to inform sampling design including location and length of transects, and number and location of impact and control sites.	<input type="checkbox"/>								
	 NOTE: Figure 5.1 outlines the recommended approach for a hypothetical spill trajectory based on pre-spill planning. The implemented sampling design should be updated to reflect the actual spill trajectory									
	Deploy personnel and equipment within 7 days to quantify temporal and spatial distribution of hydrocarbons in marine waters and identify zones of exposure.	<input type="checkbox"/>								
	Review design after each sampling event and amend as necessary	<input type="checkbox"/>								
Complete OM03 checklists	Complete/service provider to complete SM01 Pre-mobilisation Checklist	<input type="checkbox"/>								
	Complete/service provider to complete SM01 Work Platform Checklist	<input type="checkbox"/>								
	Complete/service provider to complete SM01 Equipment Checklist	<input type="checkbox"/>								
	Request service provider review and follow SM01 Sampling Procedure Checklist for guidance	<input type="checkbox"/>								
	Provide SM01 Pre-populated Chain of Custody to Service Provider	<input type="checkbox"/>								
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>								
	Provide IMT Planning Section Chief with SM01 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>								
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time)	<input type="checkbox"/>								
	Obtain final sampling report following termination of SM01	<input type="checkbox"/>								

Operational and Scientific Monitoring Program

Form 9: SM02 EUL Action Checklist


MARINE SEDIMENTS

Action	Item	Check									
Coordinate sampling by RPS	Liaise with RPS OSMP Program Manager and activate SM02 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>									
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>[REDACTED]</td> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> <tr> <td>[REDACTED]</td> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> </tbody> </table>	RPS Program manager*	Contact details	Status	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
	RPS Program manager*	Contact details	Status								
[REDACTED]	[REDACTED]	[REDACTED]									
[REDACTED]	[REDACTED]	[REDACTED]									
<i>*During periods of leave/absence alternative contact details will be provided.</i>											
	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>									
Develop and implement sampling design	Review OM01, OM02 and OM03 output to inform sampling design including location and length of transects, and number and location of impact and control sites	<input type="checkbox"/>									
	<div style="border: 1px solid black; padding: 5px;">  <p>NOTE: Figure 5.2 outlines the recommended approach for a hypothetical spill trajectory based on the pre-spill scenario. The implemented sampling design should be updated to reflect the actual spill trajectory</p> </div>										
	Deploy personnel and equipment within 7 days to quantify temporal and spatial distribution of hydrocarbons in sediments compared to control sites.	<input type="checkbox"/>									
	Review design after each sampling event and amend as necessary	<input type="checkbox"/>									
Complete OM03 checklists	Complete/service provider to complete SM02 Pre-mobilisation Checklist	<input type="checkbox"/>									
	Complete/service provider to complete SM02 Work Platform Checklist	<input type="checkbox"/>									
	Complete/service provider to complete SM02 Equipment Checklist	<input type="checkbox"/>									
	Request service provider review and follow SM02 Sampling Procedure Checklist for guidance	<input type="checkbox"/>									
	Provide SM02 Pre-populated Chain of Custody to Service Provider	<input type="checkbox"/>									
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>									
	Provide IMT Planning Section Chief with SM02 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>									
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time considering weathering and persistence)	<input type="checkbox"/>									
	Obtain final sampling report following termination of SM02	<input type="checkbox"/>									

Operational and Scientific Monitoring Program

Form 10: SM03 EUL Action Checklist


SHORELINE AND INTERTIDAL SEDIMENTS AND BIOLOGICAL COMMUNITIES

Action	Item	Check								
Coordinate sampling by RPS	Liaise with RPS OSMP Program Manager and activate SM03 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>								
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>██████████</td> <td>██████████ ██████████ ████████████████████</td> <td>██████████</td> </tr> <tr> <td>██████████</td> <td>██████████ ██████████ ████████████████████</td> <td>██████████</td> </tr> </tbody> </table> <p><i>*During periods of leave/absence alternative contact details will be provided.</i></p>	RPS Program manager*	Contact details	Status	██████████	██████████ ██████████ ████████████████████	██████████	██████████	██████████ ██████████ ████████████████████	██████████
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	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>								
Develop and implement sampling design	Review OM01, OM02 and OM03 output to inform sampling design including number and location of impact and control sites and location and length of transects at each	<input type="checkbox"/>								
	<div style="border: 1px solid black; padding: 5px;">  <p>NOTE: Figure 5.3 outlines the recommended approach for a hypothetical spill trajectory based on the pre-spill scenario. The implemented sampling design should be updated to reflect the actual spill trajectory</p> </div>									
	Survey timing should allow for capture of natural (including seasonal) variability, and consider tidal cycles. Where parameters are expected to have high seasonal variability, sampling should be undertaken more frequently	<input type="checkbox"/>								
	Deploy personnel and equipment within 7 days to collect quantitative data on short/long-term, direct/in-direct impacts and monitoring recovery.	<input type="checkbox"/>								
	Review design after each sampling event and amend as necessary	<input type="checkbox"/>								
Complete OM03 checklists	Complete/service provider to complete SM03 Pre-mobilisation Checklist	<input type="checkbox"/>								
	Complete/service provider to complete SM03 Work Platform Checklist	<input type="checkbox"/>								
	Complete/service provider to complete SM03 Equipment Checklist	<input type="checkbox"/>								
	Request service provider review and follow SM03 Sampling Procedure Checklist for guidance	<input type="checkbox"/>								
	Provide SM03 Pre-populated Chain of Custody to Service Provider	<input type="checkbox"/>								
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>								
	Provide IMT Planning Section Chief with SM03 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>								
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time considering weathering and persistence)	<input type="checkbox"/>								
	Obtain final sampling report following termination of SM03	<input type="checkbox"/>								

Operational and Scientific Monitoring Program

Form 11: SM04 EUL Action Checklist


SUBTIDAL BENTHIC HABITATS AND BIOLOGICAL COMMUNITIES

Action	Item	Check									
Coordinate sampling by RPS	Liaise with RPS OSMP Program Manager and activate SM04 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>									
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> </tbody> </table>	RPS Program manager*	Contact details	Status	██████████	██████████ ██████████ ██████████	██████████	██████████	██████████ ██████████ ██████████	██████████	
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<i>*During periods of leave/absence alternative contact details will be provided.</i>											
	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>									
Develop and implementsampling design	Review OM01-OM05 output to inform sampling design including number and location of impact and control sites	<input type="checkbox"/>									
	<div style="border: 1px solid black; padding: 5px;">  <p>NOTE: Figure 5.4 outlines the recommended approach for a hypothetical spill trajectory based on the pre-spill scenario. The implemented sampling design should be updated to reflect the actual spill trajectory</p> </div>										
	Deploy personnel and equipment within 7 days to collect quantitative data on short/long-term, direct/in-direct impacts and monitoring recovery.	<input type="checkbox"/>									
	Review design after each sampling event and amend as necessary	<input type="checkbox"/>									
Complete checklists	Complete/service provider to complete SM04 Pre-mobilisation Checklist	<input type="checkbox"/>									
	Complete/service provider to complete SM04 Work Platform Checklist	<input type="checkbox"/>									
	Complete/service provider to complete SM04 Equipment Checklist	<input type="checkbox"/>									
	Request service provider review and follow SM04 Sampling Procedure Checklist for guidance	<input type="checkbox"/>									
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>									
	Provide IMT Planning Section Chief with SM04 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>									
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time considering weathering and persistence)	<input type="checkbox"/>									
	Obtain final sampling report following termination of SM04	<input type="checkbox"/>									

Operational and Scientific Monitoring Program

Form 12: SM05 EUL Action Checklist


BIRDS (Seabirds, Shorebirds, Migratory Birds and Aquatic Birds)

Action	Item	Check									
Coordinate survey and oiled bird response by RPS	Liaise with RPS OSMP Program Manager and activate SM05 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>									
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> </tbody> </table>	RPS Program manager*	Contact details	Status	██████████	██████████ ██████████ ██████████	██████████	██████████	██████████ ██████████ ██████████	██████████	
	RPS Program manager*	Contact details	Status								
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<i>*During periods of leave/absence alternative contact details will be provided.</i>											
	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>									
Develop and implement sampling design	Review OM01-OM05 output in relation to potential indicator species (Tables 5.7 and 5.8) within the EMBA, to inform sampling design including number and location of impact and control sites	<input type="checkbox"/>									
	Deploy personnel and equipment within 7 days to assess impacts from exposure to hydrocarbons and response activities and monitor recovery	<input type="checkbox"/>									
	Review design after each survey and amend as necessary	<input type="checkbox"/>									
Prepare for fauna collection and tissue sampling	Liaise with AMSA/DELWP/EPA-TAS to confirm arrangements for oiled wildlife and to obtain any permit/licence required for collection of oiled/deceased wildlife and/or tissue samples	<input type="checkbox"/>									
	Ensure veterinary pathologist is available to coordinate necropsies (and subsequent pathological or toxicological tests) for diagnosing likely cause of mortality of individuals collected (refer to SM06)	<input type="checkbox"/>									
<div style="border: 1px solid black; padding: 5px;">  <p>NOTE: Standardised protocols for carcass handling and necropsy procedures are included in Latimer and Rakich (1994) Chapter 14. Necropsy Examination. In: Avian Medicine: Principles and Application</p> </div>											
Complete checklists	Complete/service provider(s) to complete SM05 Pre-mobilisation Checklist	<input type="checkbox"/>									
	Complete/service provider(s) to complete SM05 Work Platform Checklist	<input type="checkbox"/>									
	Complete/service provider(s) to complete SM05 Equipment Checklist	<input type="checkbox"/>									
	Request service provider(s) review and follow SM05 Sampling Procedure Checklist for guidance	<input type="checkbox"/>									
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>									
	Provide IMT Planning Section Chief with SM05 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>									
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time)	<input type="checkbox"/>									
	Obtain final survey report following termination of SM05	<input type="checkbox"/>									

Operational and Scientific Monitoring Program

Form 13: SM06 EUL Action Checklist

MARINE MEGAFUNA (Cetaceans, Pinnipeds and Marine Turtles)

Action	Item	Check								
Coordinate survey by RPS	Liaise with RPS OSMP Program Manager and activate SM06 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>								
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>J [REDACTED]</td> <td>[REDACTED] [REDACTED] [REDACTED]</td> <td>[REDACTED]</td> </tr> <tr> <td>[REDACTED]</td> <td>[REDACTED] [REDACTED] [REDACTED]</td> <td>[REDACTED]</td> </tr> </tbody> </table> <p><i>*During periods of leave/absence alternative contact details will be provided.</i></p>	RPS Program manager*	Contact details	Status	J [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED]
RPS Program manager*	Contact details	Status								
J [REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED]								
[REDACTED]	[REDACTED] [REDACTED] [REDACTED]	[REDACTED]								
	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>								
Develop and implement survey design	Review OM01-OM05 output in relation to indicator species and biologically important areas known to occur within the EMBA (Tables 5.9 and 5.10), including assessment of likelihood of presence/absence and life-cycle stage to inform sampling design	<input type="checkbox"/>								
	Implement vessel and /or aerial (fixed wing, helicopter or UAV) surveys	<input type="checkbox"/>								
	Deploy personnel and equipment within 7 days to confirm presence/absence of marine megafauna and assess lethal/sub-lethal impacts and monitor recovery	<input type="checkbox"/>								
	Review design after each survey and amend as necessary	<input type="checkbox"/>								
Prepare for fauna collection and tissue sampling	Liaise with AMSA/DELWP/EPA-TAS to confirm arrangements for oiled wildlife and to obtain any permit/licence required for collection of oiled/deceased wildlife and/or tissue samples	<input type="checkbox"/>								
	Ensure veterinary pathologist is available to coordinate necropsies (and subsequent pathological or toxicological tests) for diagnosing likely cause of mortality of individuals collected	<input type="checkbox"/>								
	 NOTE: Standardised protocols for marine mammal handling, sampling and necropsy are included in Ziccardi et al. 2015, Pinniped and Cetacean Oil Spill Response Guidelines									
Complete checklists	Complete/service provider(s) to complete SM06 Pre-mobilisation Checklist	<input type="checkbox"/>								
	Complete/service provider(s) to complete SM06 Work Platform Checklist	<input type="checkbox"/>								
	Complete/service provider(s) to complete SM06 Equipment Checklist	<input type="checkbox"/>								
	Request service provider(s) review and follow SM06 Sampling Procedure Checklist for guidance	<input type="checkbox"/>								
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>								
	Provide IMT Planning Section Chief with SM06 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>								
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time)	<input type="checkbox"/>								
	Obtain final survey report following termination of SM06	<input type="checkbox"/>								

Operational and Scientific Monitoring Program

Form 14: SM07 EUL Action Checklist

RECREATIONAL, COMMERCIAL AND TRADITIONAL FISHERIES

Action	Item	Check								
Coordinate survey	Liaise with RPS OSMP Program Manager and activate SM07 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>								
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> <tr> <td>██████████</td> <td>██████████ ██████████ ██████████</td> <td>██████████</td> </tr> </tbody> </table> <p><i>*During periods of leave/absence alternative contact details will be provided.</i></p>	RPS Program manager*	Contact details	Status	██████████	██████████ ██████████ ██████████	██████████	██████████	██████████ ██████████ ██████████	██████████
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	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>								
Develop and implement survey and sampling design	Review OM01-OM05 output in relation to sites (Figure 5.6) and indicator species for the region (Table 5.11)	<input type="checkbox"/>								
	Confirm outcome from Liaison Officer consultation with Australian Fisheries Management Authority , Victorian Fisheries Authority , Fishing Tasmania and Department of Natural Resources and Environment Tasmania regarding fisheries operations where samples should be collected	<input type="checkbox"/>								
	Consider gradient approach/lines of evidence sampling design for offshore plume that dissipates from source and confirm relevant indicators species considering likely pathways of exposure (surface slicks, entrained/dissolved hydrocarbons in the water column and/or submerged hydrocarbons associated with benthic sediments)	<input type="checkbox"/>								
	Ensure Animal Ethic permits are in place for research involving vertebrate animals	<input type="checkbox"/>								
	Confirm RPS are liaising with pathology lab for histopathological analyses (Table 5.12)	<input type="checkbox"/>								
	Deploy personnel and equipment within 7 days to assess impacts to fish and shellfish species and seafood quality and safety	<input type="checkbox"/>								
	Collate information on catch rates, species composition, community abundance, distribution or age structure from commercial fisheries, where relevant, in the years following the spill, to identify potential long term impacts	<input type="checkbox"/>								
	Report sightings of fish kills to AFMA, VFA and/or EPA-Tas depending on jurisdiction.	<input type="checkbox"/>								
	Review design after each survey and amend as necessary	<input type="checkbox"/>								
Complete checklists	Complete/service provider(s) to complete SM07 Pre-mobilisation Checklist	<input type="checkbox"/>								
	Complete/service provider(s) to complete SM07 Work Platform Checklist	<input type="checkbox"/>								
	Complete/service provider(s) to complete SM07 Equipment Checklist	<input type="checkbox"/>								
	Request service provider(s) review and follow SM07 Sampling Procedure Checklist for guidance	<input type="checkbox"/>								
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>								
	Provide IMT Planning Section Chief with SM07 updates (field survey reports and analytical reports as available)	<input type="checkbox"/>								
	Review results against termination criteria to determine ongoing monitoring requirements (typically expected to decrease over time)	<input type="checkbox"/>								
	Obtain final survey report following termination of SM07	<input type="checkbox"/>								

Form 15: SM08 EUL Action Checklist

Operational and Scientific Monitoring Program

RECREATIONAL, COMMERCIAL AND INDUSTRIAL USERS											
Action	Item	Check									
Identify who will be impacted	Review OM01-OM05 output in relation to identified socio-economic and cultural resources at risk (Table 5.14)	<input type="checkbox"/>									
	Liaise with PIO to identify who is likely to be impacted and collate contact details	<input type="checkbox"/>									
Coordinate assessment by RPS	Contact RPS OSMP Program Manager and activate SM08 within 2 days following notification of Level 2/3 spill	<input type="checkbox"/>									
	<table border="1"> <thead> <tr> <th>RPS Program manager*</th> <th>Contact details</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>██████████</td> <td>████████████████████ ████████████████████ ████████████████████</td> <td>██████████</td> </tr> <tr> <td>██████████</td> <td>████████████████████ ████████████████████ ████████████████████</td> <td>██████████</td> </tr> </tbody> </table>	RPS Program manager*	Contact details	Status	██████████	████████████████████ ████████████████████ ████████████████████	██████████	██████████	████████████████████ ████████████████████ ████████████████████	██████████	
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<i>*During periods of leave/absence alternative contact details will be provided.</i>											
	Confirm Supply Unit Leader has executed OSMP service contract to allow mobilisation	<input type="checkbox"/>									
	Commence assessment within 7 days to determine extent, severity and likely presence of direct/indirect impacts on users and identify ongoing monitoring requirements	<input type="checkbox"/>									
	Review assessment methodology periodically and as new information becomes available, and amend as necessary	<input type="checkbox"/>									
Notify	Request PIO/Liaison Officer to liaise with identified users and traditional owners of potentially impacted areas, as required	<input type="checkbox"/>									
Long term monitoring	Work with identified users and traditional owners of areas requiring long term monitoring to develop an ongoing monitoring plan	<input type="checkbox"/>									
Complete checklists	Request service provider(s) review and follow SM08 Assessment Procedure Checklist for guidance	<input type="checkbox"/>									
Review and report	Notify IMT planning team of all support requests and expected delivery times	<input type="checkbox"/>									
	Provide IMT Planning Section Chief with SM08 updates (assessment progress reports as available)	<input type="checkbox"/>									
	Review reports against termination criteria to determine ongoing assessment requirements	<input type="checkbox"/>									
	Obtain final assessment report following termination of SM08	<input type="checkbox"/>									

Operational and Scientific Monitoring Program

Appendix 2: Baseline Information Sources

Relevant OMP/SMP Number	Existing baseline data	Source/data custodian	Spatial extent	Temporal extent	Methods	Parameters
Water Quality						
OM03 SM01	161 datasets within Ocean Database	Open Access to Ocean Data (aodn.org.au)	Australia	Various historical and current measurements; earliest dataset 1844	AUV, Biological Platform, Fixed Stations, Float, Glider, Mooring and Buoy, Radar, Satellite, Vessel	Biological: Chlorophyll, Nutrient, Pigments, Suspended Particulate Material Chemical: Alkalinity, Carbon, Nutrient, Oxygen, pH, Suspended Particulate Material Physical: Density, Optical Properties, Salinity, Temperature, Turbidity, Water Pressure
	Australian and New Zealand guidelines for fresh and marine water quality	Fresh and marine water (Australia and New Zealand) (waterquality.gov.au)	Australia	2018 revision	N/A	Toxicant default guideline values
Sediment Quality						
OM05 SM02	Carvalho, Rafael C., Kennedy, David, Ierodiakonou, Daniel. Surficial sediment data along the shoreface and inner continental shelf of western Victoria, Australia, Data in Brief, Volume 45, 2022, 108563, ISSN 2352-3409, https://doi.org/10.1016/j.dib.2022.108563 .	https://www.sciencedirect.com/science/article/pii/S2352340922007703	Victorian Coastline, Australia	Oct 2018 - Nov 2020, discrete samples	Shipek/Van veen grabs. Loss on Ignition for Organic Carbon %, laser particle for grain size analysis	Grain size and organic carbon content of surficial sediments
	Erlania, Alecia Bellgrove, Peter I. Macreadie, Mary A. Young, Owen J. Holland, Zach Clark, Daniel Ierodiakonou, Rafael C. Carvalho, David Kennedy, Adam D. Miller, Patterns and drivers of macroalgal 'blue carbon' transport and deposition in near-shore coastal environments, Science of The Total Environment, Volume 890, 2023, 164430, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2023.164430 .	https://www.sciencedirect.com/science/article/pii/S0048969723030516	Victorian coastline, Australia	July 2019 - Nov 2020	Loss on Ignition for Organic Carbon %	Organic carbon in surficial sediments
	AusSeaBed Marine Data	AusSeaBed Marine Data Portal (ga.gov.au)	Australia	Various	Various (MARS)	Grain size
	Australian and New Zealand guidelines for fresh and marine water quality	Fresh and marine water (Australia and New Zealand) (waterquality.gov.au)	Australia	2018 revision	N/A	Toxicant default guideline values
Benthic Habitats						
OM05 SM03 SM04	Statewide Marine Habitat Map	Statewide Marine Habitat Map (marineandcoasts.vic.gov.au)	Victoria, Australia	Ground truth data range from 1949 - 2019	Modelling based on various ground truthing	Benthic habitat map
	Micheli D. P. Costa, Melissa Wartman, Peter I. Macreadie, Lawrence W. Ferns, Rhiannon L. Holden, Daniel Ierodiakonou, Kimberley J. MacDonald, Tessa K. Mazor, Rebecca Morris, Emily Nicholson, Andrew Pomeroy, Elisa A. Zavadil, Mary Young, Rohan Snartt, Paul Carnell,	Spatially explicit ecosystem accounts for coastal wetland restoration - ScienceDirect	Victoria, Australia	use of SEEA EA database	Identification of coastal wetlands	Map of coastal wetlands along Victorian coastline
	Marine and Coastal Victoria Shoreline Surveys DEECA, Deakin Uni, Melbourne Uni	Data Access and Data Management (marineandcoasts.vic.gov.au)	Victoria, Australia	30 sites, every 6-8 weeks, 2018 - ongoing	Drone based beach surveys, citizen science surveys	Images of shoreline
	Erlania, Alecia Bellgrove, Peter I. Macreadie, Mary A. Young, Owen J. Holland, Zach Clark, Daniel Ierodiakonou, Rafael C. Carvalho, David Kennedy, Adam D. Miller, Patterns and drivers of macroalgal 'blue carbon' transport and deposition in near-shore coastal environments, Science of The Total Environment, Volume 890, 2023, 164430, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2023.164430 .	https://www.sciencedirect.com/science/article/pii/S0048969723030516	Victorian coastline, Australia	July 2019 - Nov 2020	eDNA for macroalgal richness	Macroalgal richness and diversity
	Statewide assessment of Victorian marine protected areas using existing data	pvtS-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs	Habitat map
	Dianne & Birt, Matthew & Bond, Todd & Wines, Sam & Glade-Wright, Ollie & Morris, Joe & Higgs, Doug & Whitmarsh, Sasha. (2023). Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. <i>Frontiers in Marine Science</i> . 10. 10.3389/fmars.2023.1095906.	PDF Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. Frontiers in Marine Science. 10. 10.3389/fmars.2023.1095906. (researchgate.net)	Bass Strait, Australia	2020, single data collection	Remotely Operated Vehicle (ROV)	Fish and Invertebrates assemblages and density
	Porskamp, P., Schimel, A.C.G., Young, M., Rattray, A., Ldroit, Y. and Ierodiakonou, D. (2022), "Integrating multibeam echosounder water-column data into benthic habitat mapping", <i>Limnology and Oceanography</i> , Wiley. DOI: https://doi.org/10.1002/lno.12160	Integrating multibeam echosounder water-column data into benthic habitat mapping - Porskamp - 2022 - Limnology and Oceanography - Wiley Online Library	Bunurong Marine National Park	Jan 2018, single data collection for groundtruthing	Towed video ground truth	Kelp habitats
	CSIRO (2015): Marine Benthic Substrate Database - CAMRIS - Marsed. v1. CSIRO. Data Collection. https://doi.org/10.4225/08/551485612CDEE	https://doi.org/10.4225/08/551485612CDEE	Australia	1995 to Present	Modelling of seafloor	This database contains information about the distribution of 10 different types of sea floor sediment in the Australian region. It was derived from data collected and mapped by the Ocean Sciences Institute, University of Sydney.
	DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Key Ecological features search, critical habitat, threatened flora, ecological communities
	DCEEW Wetlands Database	https://www.dcceew.gov.au/water/wetlands/australian-wetlands-database/australian-ramsar-wetlands	Australia	Ongoing	Various	Ramsar and nationally important wetlands. Provides wetland type and key features of the wetland. Links to important species within wetland and lists references
	Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria, Australia	Ongoing	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
	Marine planning spatial information (AMSIS)	Marine planning spatial information - DCCCEW	Australia	Ongoing	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
	Barton, Jan, Pope, Adam and Howe, Steffan 2012, Marine protected areas of the Otway bioregion Parks Victoria, Melbourne, Vic.	http://hdl.handle.net/10536/DRO/DU:30047217	Otway Marine Protected Areas	Collation of data up to 2012	Various	Benthic habitat descriptions

Bennett Scott, Wernberg Thomas, Connell Sean D., Hobday Alistair J., Johnson Craig R., Poloczanska Elvira S. (2015) The 'Great Southern Reef': social, ecological and economic value of Australia's neglected kelp forests. <i>Marine and Freshwater Research</i> 67, 47-56.	https://doi.org/10.1071/MF15232	Great Southern Reef, Australia	NA	Desktop review	Physical, biological and economic attributes of GSR
Micheli D. P. Costa, Melissa Wartman, Peter I. Macreadie, Lawrence W. Ferns, Rhiannon L. Holden, Daniel Ierodiaconou, Kimberley J. MacDonald, Tessa K. Mazor, Rebecca Morris, Emily Nicholson, Andrew Pomeroy, Elisa A. Zavadil, Mary Young, Rohan Snartt, Paul Carnell, Spatially explicit ecosystem accounts for coastal wetland restoration, <i>Ecosystem Services</i> , Volume 65, 2024, 101574, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2023.101574 .	Spatially explicit ecosystem accounts for coastal wetland restoration - ScienceDirect	Victoria, Australia	NA	Cost benefit of coastal wetland	Spatial information on habitats
Statewide assessment of Victorian marine protected areas using existing data	pvts-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Various	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs
The Bass Strait sponge beds in southern Bass Strait	Assessment of the Conservation Values of the Bass Strait Sponge Beds Area (agriculture.gov.au)	Bass Strait	1979-1983	65-75 m contours in southern central Bass Strait	Catches of sponge by Museum Victoria

Shorebirds and Seabirds

Small Bass Strait Island Reserves	.PDF (parks.tas.gov.au)	Bass Strait Islands	Published 2000	Management Plan	Identification of threatened bird species
Albatross and Petrels Database and references within	Agreement on the Conservation of Albatrosses and Petrels - ACAP Species	Global	Various	Various	Conservation status, range and breeding/foraging patterns in Albatross and Petrel species
BirdLifeAustralia and Seabird Tracking Database	Pacific - BirdLife International https://www.seabirdtracking.org/about/	Australia	Ongoing	Citizen sciencebird photography and identification	Seabird tracking, database and references within
DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Threatened status, BIA, Species, Management Plans, Recovery Plans, references within
Victorian Biodiversity Atlas	https://www.environment.vic.gov.au/biodiversity/victorian-biodiversity-atlas	Victoria, Australia	Ongoing	Unknown	Updated every 4 -6 weeks, requires a password to access.
DCEEW Seabird Conservation Plan	https://www.dceew.gov.au/sites/default/files/env/consultations/73458222-6905-4100-ac94-d2f90656c05d/files/draft-wildlife-conservation-plan-seabirds.pdf	Australia	Ongoing	Collation of information	Lists seabirds species within Australia, foraging and breeding; ultimately links to SPRAT database
DCEEW Migratory Shorebird Conservation Plan	https://www.dceew.gov.au/sites/default/files/documents/wildlife-conservation-plan-migratory-shorebirds.pdf	Australia	Ongoing	Collation of information	Lists migratory shorebird species within Australia, foraging and breeding, threats; ultimately links to SPRAT database
Tasmanian list of beach nesting and migratory shorebirds	untitled (nre.tas.gov.au)	Tasmania, Australia	1998-1999	Bird visual surveys	Number of birds observed and locations within Tasmania
Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria, Australia	Ongoing	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.

Marine Megafauna

DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Threatened status, BIA, Species, Management Plans, references within
Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria	Long term series	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
Marine planning spatial information (AMSIS)	Marine planning spatial information - DCEEW	Australia	Long term series	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
Andrews-Goff, V., Bestley, S., Gales, N. J., Laverick, S. M., Paton, D., Polanowski, A. M., Schmitt, N. T., & Double, M. C. (2018). Humpback whale migrations to Antarctic summer foraging grounds through the southwest Pacific Ocean. <i>Scientific Reports</i> , 8(1), 12333. https://doi.org/10.1038/s41598-018-30748-4	Humpback whale migrations to Antarctic summer foraging grounds through the southwest Pacific Ocean Scientific Reports (nature.com)	Antarctica to southwest Pacific	Austral summer, 2008-2011	Satellite tagging	Migration pattern
Aulich, M. G., McCauley, R. D., Saunders, B. J., & Parsons, M. J. G. (2019a). Fin whale (<i>Balaenoptera physalus</i>) migration in Australian waters using passive acoustic monitoring. <i>Scientific Reports</i> , 9(1), 1–12.	[PDF] Fin whale (Balaenoptera physalus) migration in Australian waters using passive acoustic monitoring (researchgate.net)	Australia	2009-2017	Passive acoustic monitoring	Distribution and abundance
Carroll, E., Patenaude, N., Alexander, A., Steel, D., Harcourt, R., Childerhouse, S., Smith, S., Bannister, J., Constantine, R., & Baker, C. S. (2011). Population structure and individual movement of southern right whales around New Zealand and Australia. <i>Marine Ecology Progress Series</i> , 432, 257–268.	[PDF] Population structure and individual movement of southern right whales around New Zealand and Australia (researchgate.net)	Australia and New Zealand	NA	DNA	Genetic differences in populations
Gill, P. C., Pirzl, R., Morrice, M. G., & Lawton, K. (2015). Cetacean diversity of the continental shelf and slope off southern Australia. <i>The Journal of Wildlife Management</i> , 79(4), 672–681.	[PDF] Cetacean diversity of the continental shelf and slope off southern Australia (researchgate.net)	Southern Australia	2002-2013	Aerial surveys	Cetacean diversity and abundance
Gill, P., Morrice, M., Page, B., Pirzl, R., Levings, A., & Coyne, M. (2011). Blue whale habitat selection and within-season distribution in a regional upwelling system off southern Australia. <i>Marine Ecology Progress Series</i> , 421, 243–263.	[PDF] Blue whale habitat selection and within-season distribution in a regional upwelling system off southern Australia (researchgate.net)	Southern Australia	2001-2007	Aerial surveys	Blue whale distribution and habitat selection
Möller, L. M., Attard, C. R. M., Bilgmann, K., Andrews-Goff, V., Jonsen, I., Paton, D., & Double, M. C. (2020). Movements and behaviour of blue whales satellite tagged in an Australian upwelling system. <i>Nature Scientific Reports</i> , 10(21165).	Movements and behaviour of blue whales satellite tagged in an Australian upwelling system Scientific Reports (nature.com)	Southern Australia	2015	Satellite tagging	Blue whale migration

Möller, L. M., & Beheregaray, L. B. (2001). Coastal bottlenose dolphins from southeastern Australia are Tursiops aduncus according to sequences of the mitochondrial DNA control region. Marine Mammal Science, 17(2), 249–263.	COASTAL BOTTLENOSE DOLPHINS FROM SOUTHEASTERN AUSTRALIA ARE TURSIOPS ADUNCUS ACCORDING TO SEQUENCES OF THE MITOCHONDRIAL DNA CONTROL REGION - Möller - 2001 - Marine Mammal Science - Wiley Online Library	Southern Australia	Unknown	DNA, Photo ID	Population area
Stamation, K., Watson, M., Moloney, P., Charlton, C., & Bannister, J. (2020). Population estimate and rate of increase of southern right whales <i>Eubalaena australis</i> in southeastern Australia. Endangered Species Research, 41, 373–383.	(PDF) Population estimate and rate of increase of southern right whales Eubalaena australis in southeastern Australia. (researchgate.net)	Southern Australia	1996-2017; whale watching season	Sightings, photo ID	Population estimate
Arnould, J., & Kirkwood, R. (2008). Habitat selection by female Australian fur seals (<i>Arctocephalus pusillus doriferus</i>). Aquatic Conservation: Marine and Freshwater Ecosystems, 17, S53–S67.	Aquatic Conservation: Marine and Freshwater Ecosystems Aquatic Journal Wiley Online Library	South-east Australia	2001 - 2003	Satellite telemetry	Foraging behaviour and at sea movement
Kirkwood, R., Lynch, M., Gales, N., Dann, P., & Sumner, M. (2006). At-sea movements and habitat use of adult male Australian fur seals (<i>Arctocephalus pusillus doriferus</i>). Canadian Journal of Zoology, 84(12), 1781–1788.	At-sea movements and habitat use of adult male Australian fur seals (Arctocephalus pusillus doriferus). (cdnsiencepub.com)	South-east Australia	1999 - 2001	Satellite telemetry	Foraging behaviour and at sea movement

Fisheries and Aquaculture

DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Threatened status, BIA, Species, Management Plans, references within
Statewide assessment of Victorian marine protected areas using existing data	pvts-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Various	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs
Dianne & Birt, Matthew & Bond, Todd & Wines, Sam & Glade-Wright, Ollie & Morris, Joe & Higgs, Doug & Whitmarsh, Sasha. (2023). Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. Frontiers in Marine Science. 10. 10.3389/fmars.2023.1095906.	(PDF) Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. (researchgate.net)	Bass Strait, Australia	2020, single data collection	Remotely Operated Vehicle (ROV)	Fish and Invertebrates assemblages and density
Bosch NE, Monk J, Goetze J, Wilson S, Babcock RC, Barrett N, Clough J, Currey-Randall LM, Fairclough DV, Fisher R, Gibbons BA, Harasti D, Harvey ES, Heupel MR, Hicks JL, Holmes TH, Huveneers C, Ierodiakonou D, Jordan A, Knott NA, Malcolm HA, McLean D, Meekan M, Newman SJ, Radford B, Rees MJ, Saunders BJ, Speed CW, Travers MJ, Wakefield CB, Wernberg T, Langlois TJ. Effects of human footprint and biophysical factors on the body-size structure of fished marine species. Conserv Biol. 2022 Apr;36(2):e13807. doi: 10.1111/cobi.13807. Epub 2021 Jul 27. PMID: 34312893; PMCID: PMC9292308.	Effects of human footprint and biophysical factors on the body-size structure of fished marine species - PubMed (nih.gov)	Australian waters up to 50m depth	2004-2017	BRUVS deployments	Species ID, length
Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria, Australia	Ongoing	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
Marine planning spatial information (AMSIS)	Marine planning spatial information - DCCFEW	Australia	Ongoing	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
Australian Fisheries Management Authority	Fisheries Australian Fisheries Management Authority (afma.gov.au)	Australia & Territories	Ongoing	Various	Fisheries information on active fisheries around Australia
Conron, SD, Bell, JD, Ingram, BA and Gorfine, HK (2020) Review of key Victorian fish stocks — 2019, Victorian Fisheries Authority Science Report Series No. 15, First Edition, November 2020. VFA: Queenscliff. 176pp	FINAL_VFA_Sci_Assess_#1_Vic_Fish_Stock_Status_Review_20171121	Victoria, Australia	2019	Fishery dependent surveys, CPUE	Fish stock status of Victorian fishers - risk based approach
Assessment of the Values of Victoria's Marine Environment (VEAC, 2019)	Previous VEAC Assessments & Advice - VEAC Victorian Environmental Assessment Council	Victoria, Australia	Published 2019	Desktop survey	Atlas, summary report and full report on values of marine environment
Victorian Fisheries Authority	Home - VFA	Victoria, Australia	Ongoing	Various	Information on commercial and recreational fisheries and fisheries management in Victoria

Recreational, Commercial and Industrial Users

Social and Economic Survey of Recreational Fishers 2018-2021 (FRDC)	victoria_rec_fishing_survey_-_web.pdf (frdc.com.au)	Victoria, Australia	2018-2021	Surveys	Breakdown of recreational fishers and the economic impact
Survey of Recreational fishing in Tasmania	Some information on preparing tables Tables. (fishing.tas.gov.au)	Tasmania, Australia	2018-2019	Surveys	Catch per unit effort, fishers attitudes and awareness
Victorian Fisheries Authority	Home - VFA	Victoria, Australia	Ongoing	Various	Information on commercial and recreational fisheries and fisheries management in Victoria
The economic value of recreational boating in Victoria, Better Boating Australia and Victorian Fisheries Authority	The economic value of recreational boating in Victoria-2020-Ernst-and-Young-Report.pdf (vfa.vic.gov.au)	Victoria, Australia	2020	Online Survey	Number of recreational boatin and the economic impact
Domestic commercial vessels fleet profile (AMSA)	Domestic commercial vessels fleet profile Australian Maritime Safety Authority (amsa.gov.au)	Australia	Ongoing	Collation of licence data	Breakdown of domestic commercial vessels working within Australia EEZ.
AMSA shipping data	Spatial data gateway Australian Maritime Safety Authority (amsa.gov.au)	Australia	Live database	Mapping	Historical vessel tracking, positional information for aids to vessel navigation network. Provided in ESRI shapefiles, kml, data files (csv) and PDF maps.
NOPTA National Electronic Approvals Tracking System	Home NEATS (nopta.gov.au)	Australia	Live database	Mapping	Spatial information on offshore energy users (petroleum and offshore wind)
Marine planning spatial information (AMSIS)	Marine planning spatial information - DCCFEW	Australia	Ongoing	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses

OM05
SM07

OM05
SM08

Relevant OMP/SMP Number	Existing baseline data	Source/data custodian	Spatial extent	Temporal extent	Methods	Parameters
Water Quality						
OM03 SM01	161 datasets within Ocean Database	Open Access to Ocean Data (aodn.org.au)	Australia	Various historical and current measurements; earliest dataset 1844	AUV, Biological Platform, Fixed Stations, Float, Glider, Mooring and Buoy, Radar, Satellite, Vessel	Biological: Chlorophyll, Nutrient, Pigments, Suspended Particulate Material Chemical: Alkalinity, Carbon, Nutrient, Oxygen, pH, Suspended Particulate Material Physical: Density, Optical Properties, Salinity, Temperature, Turbidity, Water Pressure
	Australian and New Zealand guidelines for fresh and marine water quality	Fresh and marine water (Australia and New Zealand) (waterquality.gov.au)	Australia	2018 revision	N/A	Toxicant default guideline values
Sediment Quality						
OM05 SM02	Carvalho, Rafael C., Kennedy, David, Ierodiakonou, Daniel. Surficial sediment data along the shoreface and inner continental shelf of western Victoria, Australia, Data in Brief, Volume 45, 2022, 108563, ISSN 2352-3409, https://doi.org/10.1016/j.dib.2022.108563 .	https://www.sciencedirect.com/science/article/pii/S2352340922007703	Victorian Coastline, Australia	Oct 2018 - Nov 2020, discrete samples	Shipek/Van veen grabs. Loss on Ignition for Organic Carbon %, laser particle for grain size analysis	Grain size and organic carbon content of surficial sediments
	Erlania, Alecia Bellgrove, Peter I. Macreadie, Mary A. Young, Owen J. Holland, Zach Clark, Daniel Ierodiakonou, Rafael C. Carvalho, David Kennedy, Adam D. Miller, Patterns and drivers of macroalgal 'blue carbon' transport and deposition in near-shore coastal environments, Science of The Total Environment, Volume 890, 2023, 164430, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2023.164430 .	https://www.sciencedirect.com/science/article/pii/S0048969723030516	Victorian coastline, Australia	July 2019 - Nov 2020	Loss on Ignition for Organic Carbon %	Organic carbon in surficial sediments
	AusSeaBed Marine Data	AusSeaBed Marine Data Portal (ga.gov.au)	Australia	Various	Various (MARS)	Grain size
	Australian and New Zealand guidelines for fresh and marine water quality	Fresh and marine water (Australia and New Zealand) (waterquality.gov.au)	Australia	2018 revision	N/A	Toxicant default guideline values
Benthic Habitats						
OM05 SM03 SM04	Statewide Marine Habitat Map	Statewide Marine Habitat Map (marineandcoasts.vic.gov.au)	Victoria, Australia	Ground truth data range from 1949 - 2019	Modelling based on various ground truthing	Benthic habitat map
	Micheli D. P. Costa, Melissa Wartman, Peter I. Macreadie, Lawrence W. Ferns, Rhiannon L. Holden, Daniel Ierodiakonou, Kimberley J. MacDonald, Tessa K. Mazon, Rebecca Morris, Emily Nicholson, Andrew Pomeroy, Elisa A. Zavadil, Mary Young, Rohan Snartt, Paul Carnell,	Spatially explicit ecosystem accounts for coastal wetland restoration - ScienceDirect	Victoria, Australia	use of SEEA EA database	Identification of coastal wetlands	Map of coastal wetlands along Victorian coastline
	Marine and Coastal Victoria Shoreline Surveys DEECA, Deakin Uni, Melbourne Uni	Data Access and Data Management (marineandcoasts.vic.gov.au)	Victoria, Australia	30 sites, every 6-8 weeks, 2018 - ongoing	Drone based beach surveys, citizen science surveys	Images of shoreline
	Erlania, Alecia Bellgrove, Peter I. Macreadie, Mary A. Young, Owen J. Holland, Zach Clark, Daniel Ierodiakonou, Rafael C. Carvalho, David Kennedy, Adam D. Miller, Patterns and drivers of macroalgal 'blue carbon' transport and deposition in near-shore coastal environments, Science of The Total Environment, Volume 890, 2023, 164430, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2023.164430 .	https://www.sciencedirect.com/science/article/pii/S0048969723030516	Victorian coastline, Australia	July 2019 - Nov 2020	eDNA for macroalgal richness	Macroalgal richness and diversity
	Statewide assessment of Victorian marine protected areas using existing data	pvt-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs	Habitat map
	Dianne & Birt, Matthew & Bond, Todd & Wines, Sam & Glade-Wright, Ollie & Morris, Joe & Higgs, Doug & Whitmarsh, Sasha. (2023). Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. <i>Frontiers in Marine Science</i> . 10. 10.3389/fmars.2023.1095906.	[PDF] Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. Frontiers in Marine Science. 10. 10.3389/fmars.2023.1095906.	Bass Strait, Australia	2020, single data collection	Remotely Operated Vehicle (ROV)	Fish and Invertebrates assemblages and density
	Porskamp, P., Schimel, A.C.G., Young, M., Rattray, A., Ldroit, Y. and Ierodiakonou, D. (2022), "Integrating multibeam echosounder water-column data into benthic habitat mapping", <i>Limnology and Oceanography</i> , Wiley. DOI: https://doi.org/10.1002/lno.12160	Integrating multibeam echosounder water-column data into benthic habitat mapping - Porskamp - 2022 - Limnology and Oceanography - Wiley Online Library	Bunorong Marine National Park	Jan 2018, single data collection for groundtruthing	Towed video ground truth	Kelp habitats
	CSIRO (2015): Marine Benthic Substrate Database - CAMRIS - Marsed. v1. CSIRO. Data Collection. https://doi.org/10.4225/08/551485612CDEE	https://doi.org/10.4225/08/551485612CDEE	Australia	1995 to Present	Modelling of seafloor	This database contains information about the distribution of 10 different types of sea floor sediment in the Australian region. It was derived from data collected and mapped by the Ocean Sciences Institute, University of Sydney.
	DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Key Ecological features search, critical habitat, threatened flora, ecological communities
	DCEEW Wetlands Database	https://www.dcceew.gov.au/water/wetlands/australian-wetlands-database/australian-ramsar-wetlands	Australia	Ongoing	Various	Ramsar and nationally important wetlands. Provides wetland type and key features of the wetland. Links to important species within wetland and lists references
	Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria, Australia	Ongoing	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
	Marine planning spatial information (AMSIS)	Marine planning spatial information - DCEEW	Australia	Ongoing	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
	Barton, Jan, Pope, Adam and Howe, Steffan 2012, Marine protected areas of the Otway bioregion Parks Victoria, Melbourne, Vic.	http://hdl.handle.net/10536/DRO/DU:30047217	Otway Marine Protected Areas	Collation of data up to 2012	Various	Benthic habitat descriptions

	Bennett Scott, Wernberg Thomas, Connell Sean D., Hobday Alistair J., Johnson Craig R., Poloczanska Elvira S. (2015) The 'Great Southern Reef': social, ecological and economic value of Australia's neglected kelp forests. <i>Marine and Freshwater Research</i> 67, 47-56.	https://doi.org/10.1071/MF15232	Great Southern Reef, Australia	NA	Desktop review	Physical, biological and economic attributes of GSR
	Micheli D. P. Costa, Melissa Wartman, Peter I. Macreadie, Lawrence W. Ferns, Rhiannon L. Holden, Daniel Ierodiaconou, Kimberley J. MacDonald, Tessa K. Mazor, Rebecca Morris, Emily Nicholson, Andrew Pomeroy, Elisa A. Zavadil, Mary Young, Rohan Snartt, Paul Carnell, Spatially explicit ecosystem accounts for coastal wetland restoration, <i>Ecosystem Services</i> , Volume 65, 2024, 101574, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2023.101574 .	Spatially explicit ecosystem accounts for coastal wetland restoration - ScienceDirect	Victoria, Australia	NA	Cost benefit of coastal wetland	Spatial information on habitats
	Statewide assessment of Victorian marine protected areas using existing data	pvts-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Various	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs
	The Bass Strait sponge beds in southern Bass Strait	Assessment of the Conservation Values of the Bass Strait Sponge Beds Area (agriculture.gov.au)	Bass Strait	1979-1983	65-75 m contours in southern central Bass Strait	Catches of sponge by Museum Victoria
Shorebirds and Seabirds						
OM05 SM05	Small Bass Strait Island Reserves	.PDF (parks.tas.gov.au)	Bass Strait Islands	Published 2000	Management Plan	Identification of threatened bird species
	Albatross and Petrels Database and references within	Agreement on the Conservation of Albatrosses and Petrels - ACAP Species	Global	Various	Various	Conservation status, range and breeding/foraging patterns in Albatross and Petrel species
	BirdLifeAustralia and Seabird Tracking Database	Pacific - BirdLife International https://www.seabirdtracking.org/about/	Australia	Ongoing	Citizen sciencebird photography and identification	Seabird tracking, database and references within
	DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Threatened status, BIA, Species, Management Plans, Recovery Plans, references within
	Victorian Biodiversity Atlas	https://www.environment.vic.gov.au/biodiversity/victorian-biodiversity-atlas	Victoria, Australia	Ongoing	Unknown	Updated every 4 -6 weeks, requires a password to access.
	DCEEW Seabird Conservation Plan	https://www.dceew.gov.au/sites/default/files/env/consultations/73458222-6905-4100-ac94-d2f90656c05d/files/draft-wildlife-conservation-plan-seabirds.pdf	Australia	Ongoing	Collation of information	Lists seabirds species within Australia, foraging and breeding; ultimately links to SPRAT database
	DCEEW Migratory Shorebird Conservation Plan	https://www.dceew.gov.au/sites/default/files/documents/wildlife-conservation-plan-migratory-shorebirds.pdf	Australia	Ongoing	Collation of information	Lists migratory shorebird species within Australia, foraging and breeding, threats; ultimately links to SPRAT database
	Tasmanian list of beach nesting and migratory shorebirds	untitled (nre.tas.gov.au)	Tasmania, Australia	1998-1999	Bird visual surveys	Number of birds observed and locations within Tasmania
	Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria, Australia	Ongoing	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
Marine Megafauna						
OM05 SM06	DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Threatened status, BIA, Species, Management Plans, references within
	Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria	Long term series	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
	Marine planning spatial information (AMSIS)	Marine planning spatial information - DCEEW	Australia	Long term series	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
	Andrews-Goff, V., Bestley, S., Gales, N. J., Laverick, S. M., Paton, D., Polanowski, A. M., Schmitt, N. T., & Double, M. C. (2018). Humpback whale migrations to Antarctic summer foraging grounds through the southwest Pacific Ocean. <i>Scientific Reports</i> , 8(1), 12333. https://doi.org/10.1038/s41598-018-30748-4	Humpback whale migrations to Antarctic summer foraging grounds through the southwest Pacific Ocean Scientific Reports (nature.com)	Antarctica to southwest Pacific	Austral summer, 2008-2011	Satellite tagging	Migration pattern
	Aulich, M. G., McCauley, R. D., Saunders, B. J., & Parsons, M. J. G. (2019a). Fin whale (<i>Balaenoptera physalus</i>) migration in Australian waters using passive acoustic monitoring. <i>Scientific Reports</i> , 9(1), 1–12.	[PDF] Fin whale (Balaenoptera physalus) migration in Australian waters using passive acoustic monitoring (researchgate.net)	Australia	2009-2017	Passive acoustic monitoring	Distribution and abundance
	Carroll, E., Patenaude, N., Alexander, A., Steel, D., Harcourt, R., Childerhouse, S., Smith, S., Bannister, J., Constantine, R., & Baker, C. S. (2011). Population structure and individual movement of southern right whales around New Zealand and Australia. <i>Marine Ecology Progress Series</i> , 432, 257–268.	[PDF] Population structure and individual movement of southern right whales around New Zealand and Australia (researchgate.net)	Australia and New Zealand	NA	DNA	Genetic differences in populations
	Gill, P. C., Pirzl, R., Morrice, M. G., & Lawton, K. (2015). Cetacean diversity of the continental shelf and slope off southern Australia. <i>The Journal of Wildlife Management</i> , 79(4), 672–681.	[PDF] Cetacean diversity of the continental shelf and slope off southern Australia (researchgate.net)	Southern Australia	2002-2013	Aerial surveys	Cetacean diversity and abundance
	Gill, P., Morrice, M., Page, B., Pirzl, R., Levings, A., & Coyne, M. (2011). Blue whale habitat selection and within-season distribution in a regional upwelling system off southern Australia. <i>Marine Ecology Progress Series</i> , 421, 243–263.	[PDF] Blue whale habitat selection and within-season distribution in a regional upwelling system off southern Australia (researchgate.net)	Southern Australia	2001-2007	Aerial surveys	Blue whale distribution and habitat selection
Möller, L. M., Attard, C. R. M., Bilgmann, K., Andrews-Goff, V., Jonsen, I., Paton, D., & Double, M. C. (2020). Movements and behaviour of blue whales satellite tagged in an Australian upwelling system. <i>Nature Scientific Reports</i> , 10(21165).	Movements and behaviour of blue whales satellite tagged in an Australian upwelling system Scientific Reports (nature.com)	Southern Australia	2015	Satellite tagging	Blue whale migration	

Möller, L. M., & Beheregaray, L. B. (2001). Coastal bottlenose dolphins from southeastern Australia are Tursiops aduncus according to sequences of the mitochondrial DNA control region. Marine Mammal Science, 17(2), 249–263.	COASTAL BOTTLENOSE DOLPHINS FROM SOUTHEASTERN AUSTRALIA ARE TURSIOPS ADUNCUS ACCORDING TO SEQUENCES OF THE MITOCHONDRIAL DNA CONTROL REGION - Möller - 2001 - Marine Mammal Science - Wiley Online Library	Southern Australia	Unknown	DNA, Photo ID	Population area
Stamation, K., Watson, M., Moloney, P., Charlton, C., & Bannister, J. (2020). Population estimate and rate of increase of southern right whales <i>Eubalaena australis</i> in southeastern Australia. Endangered Species Research, 41, 373–383.	(PDF) Population estimate and rate of increase of southern right whales Eubalaena australis in southeastern Australia. (researchgate.net)	Southern Australia	1996-2017; whale watching season	Sightings, photo ID	Population estimate
Arnould, J., & Kirkwood, R. (2008). Habitat selection by female Australian fur seals (<i>Arctocephalus pusillus doriferus</i>). Aquatic Conservation: Marine and Freshwater Ecosystems, 17, S53–S67.	Aquatic Conservation: Marine and Freshwater Ecosystems Aquatic Journal Wiley Online Library	South-east Australia	2001 - 2003	Satellite telemetry	Foraging behaviour and at sea movement
Kirkwood, R., Lynch, M., Gales, N., Dann, P., & Sumner, M. (2006). At-sea movements and habitat use of adult male Australian fur seals (<i>Arctocephalus pusillus doriferus</i>). Canadian Journal of Zoology, 84(12), 1781–1788.	At-sea movements and habitat use of adult male Australian fur seals (Arctocephalus pusillus doriferus). (cdnsiencepub.com)	South-east Australia	1999 - 2001	Satellite telemetry	Foraging behaviour and at sea movement

Fisheries and Aquaculture

DCEEW Species Profile and Threats Database	Species Profiles (SPRAT) (environment.gov.au)	Australia	Ongoing	Various	Threatened status, BIA, Species, Management Plans, references within
Statewide assessment of Victorian marine protected areas using existing data	pvts-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Various	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs
Dianne & Birt, Matthew & Bond, Todd & Wines, Sam & Glade-Wright, Ollie & Morris, Joe & Higgs, Doug & Whitmarsh, Sasha. (2023). Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. Frontiers in Marine Science. 10. 10.3389/fmars.2023.1095906.	(PDF) Industry remotely operated vehicle imagery for assessing marine communities associated with subsea oil and gas infrastructure on the continental shelf of South-East Australia. (researchgate.net)	Bass Strait, Australia	2020, single data collection	Remotely Operated Vehicle (ROV)	Fish and Invertebrates assemblages and density
Bosch NE, Monk J, Goetze J, Wilson S, Babcock RC, Barrett N, Clough J, Currey-Randall LM, Fairclough DV, Fisher R, Gibbons BA, Harasti D, Harvey ES, Heupel MR, Hicks JL, Holmes TH, Huveneers C, Ierodiakonou D, Jordan A, Knott NA, Malcolm HA, McLean D, Meekan M, Newman SJ, Radford B, Rees MJ, Saunders BJ, Speed CW, Travers MJ, Wakefield CB, Wernberg T, Langlois TJ. Effects of human footprint and biophysical factors on the body-size structure of fished marine species. Conserv Biol. 2022 Apr;36(2):e13807. doi: 10.1111/cobi.13807. Epub 2021 Jul 27. PMID: 34312893; PMCID: PMC9292308.	Effects of human footprint and biophysical factors on the body-size structure of fished marine species - PubMed (nih.gov)	Australian waters up to 50m depth	2004-2017	BRUVS deployments	Species ID, length
Parks Victoria Technical Series	Parks Victoria Technical Series	Victoria, Australia	Ongoing	Various	A publication series detailing the findings of monitoring and research into the natural values and ecology of terrestrial and marine protected areas.
Marine planning spatial information (AMSIS)	Marine planning spatial information - DCCFEW	Australia	Ongoing	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
Australian Fisheries Management Authority	Fisheries Australian Fisheries Management Authority (afma.gov.au)	Australia & Territories	Ongoing	Various	Fisheries information on active fisheries around Australia
Conron, SD, Bell, JD, Ingram, BA and Gorfine, HK (2020) Review of key Victorian fish stocks — 2019, Victorian Fisheries Authority Science Report Series No. 15, First Edition, November 2020. VFA: Queenscliff. 176pp	FINAL_VFA_Sci_Assess_#1_Vic_Fish_Stock_Status_Review_20171121	Victoria, Australia	2019	Fishery dependent surveys, CPUE	Fish stock status of Victorian fishers - risk based approach
Assessment of the Values of Victoria's Marine Environment (VEAC, 2019)	Previous VEAC Assessments & Advice - VEAC Victorian Environmental Assessment Council	Victoria, Australia	Published 2019	Desktop survey	Atlas, summary report and full report on values of marine environment
Victorian Fisheries Authority	Home - VFA	Victoria, Australia	Ongoing	Various	Information on commercial and recreational fisheries and fisheries management in Victoria

Recreational, Commercial and Industrial Users

Social and Economic Survey of Recreational Fishers 2018-2021 (FRDC)	victoria_rec_fishing_survey_-_web.pdf (frdc.com.au)	Victoria, Australia	2018-2021	Surveys	Breakdown of recreational fishers and the economic impact
Survey of Recreational fishing in Tasmania	Some information on preparing tables Tables. (fishing.tas.gov.au)	Tasmania, Australia	2018-2019	Surveys	Catch per unit effort, fishers attitudes and awareness
Victorian Fisheries Authority	Home - VFA	Victoria, Australia	Ongoing	Various	Information on commercial and recreational fisheries and fisheries management in Victoria
The economic value of recreational boating in Victoria, Better Boating Australia and Victorian Fisheries Authority	The economic value of recreational boating in Victoria-2020-Ernst-and-Young-Report.pdf (vfa.vic.gov.au)	Victoria, Australia	2020	Online Survey	Number of recreational boatin and the economic impact
Domestic commercial vessels fleet profile (AMSA)	Domestic commercial vessels fleet profile Australian Maritime Safety Authority (amsa.gov.au)	Australia	Ongoing	Collation of licence data	Breakdown of domestic commercial vessels working within Australia EEZ.
AMSA shipping data	Spatial data gateway Australian Maritime Safety Authority (amsa.gov.au)	Australia	Live database	Mapping	Historical vessel tracking, positional information for aids to vessel navigation network. Provided in ESRI shapefiles, kml, data files (csv) and PDF maps.
NOPTA National Electronic Approvals Tracking System	Home NEATS (nopta.gov.au)	Australia	Live database	Mapping	Spatial information on offshore energy users (petroleum and offshore wind)
Marine planning spatial information (AMSIS)	Marine planning spatial information - DCCFEW	Australia	Ongoing	AMSIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses

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	Assessment of the Values of Victoria's Marine Environment (VEAC, 2019)	Previous VEAC Assessments & Advice - VEAC Victorian Environmental Assessment Council	Victoria, Australia	Published 2019	Desktop survey	Atlas, summary report and full report on values of marine environment
Conservation, Heritage and Native Title						
	Bennett Scott, Wernberg Thomas, Connell Sean D., Hobday Alistair J., Johnson Craig R., Poloczanska Elvira S. (2015) The 'Great Southern Reef': social, ecological and economic value of Australia's neglected kelp forests. <i>Marine and Freshwater Research</i> 67, 47-56.	https://doi.org/10.1071/MF15232	Great Southern Reef, Australia	NA	Desktop review	Physical, biological and economic attributes of GSR
	Small Bass Strait Island Reserves	.PDF (parks.tas.gov.au)	Bass Strait Islands	Published 2000	Management Plan	Identification of threatened bird species
	Statewide assessment of Victorian marine protected areas using existing data	pvt-118-sea-search.pdf (parks.vic.gov.au)	Victoria, Australia	Existing data to date (2022)	Various	Habitat maps, sea conditions, fish including VFA and reef life survey, connectivity through MPAs
	Marine planning spatial information (AMISIS)	Marine planning spatial information - DCCEEW	Australia	Ongoing	AMISIS is an interactive web-based tool and replaces the National Conservation Values Atlas	Spatial information include protected areas (marine parks and WHA) KEFs, BIAs, maritime boundaries, Native title, physical geography, and industry uses
	Assessment of the Values of Victoria's Marine Environment (VEAC, 2019)	Previous VEAC Assessments & Advice - VEAC Victorian Environmental Assessment Council	Victoria, Australia	Published 2019	Desktop survey	Atlas, summary report and full report on values of marine environment
	Cultural Heritage Database	Australian Heritage Database - DCCEEW	Australia	Ongoing	Collation of data	Database of places in the World Heritage List, National Heritage List, Commonwealth Heritage List, Register of the National Estate, places under consideration or that may have been considered
OM05 SM09	Mitchell, J (2023) 'Otway Exploration Drilling Program Desktop Maritime Heritage Assessment', Cosmos Archaeology, prepared for ConocoPhillips, J23/16.	Held by ConocoPhillips	Within EMBA	Unknown	Desktop Review	Not publicly available
	Biosis (2023) 'Otway Exploration Cultural heritage desktop assessment' prepared for ConocoPhillips Australia Pty Ltd by Biosis Pty Ltd, Port Melbourne, VIC. Project no 38331.	Held by ConocoPhillips	Within EMBA	Unknown	Desktop Review	Not publicly available
	Framlingham Aboriginal Trust and Winda Mara Aboriginal Corporation (2004)'Kooyang Sea Country Plan', Framlingham Aboriginal Trust and Winda Mara Aboriginal Corporation, NOO, Victoria	Kooyang Sea Country Plan (parksaustralia.gov.au)	Victoria, Australia	2004	Desktop Review	Information on Aboriginal Heritage and Country
	Sim R (1991) 'Prehistoric Archaeological Investigations on King and Flinders Islands, Bass Strait, Tasmania', A Thesis submitted for the Degree of Master of Arts in Prehistory, Department of Prehistory and Anthropology, Faculty of Arts, Australian National University.	Prehistoric archaeological investigations on King and Flinders Islands, Bass Strait, Tasmania (anu.edu.au)	Bass Strait Islands	Unknown	Surveys of middens and artefacts on King and Flinders Islands	Identification of Aboriginal Heritage on King and Flinders Islands
	NNTT (National Native Title Tribunal) (2023) 'Register of Indigenous Land Use Agreements', Commonwealth of Australia, NNTT, Canberra	Search Register of Indigenous Land Use Agreements (nntt.gov.au)	Australia	Ongoing	Online Database	Database of Native Title, Commonwealth