



Great Eastern Offshore Wind

Preliminary Marine Assessment Report

PREPARED FOR

CORIO

Corio Generation

DATE

17 December 2024

REFERENCE

0749798



DOCUMENT DETAILS

DOCUMENT TITLE	Great Eastern Offshore Wind
DOCUMENT SUBTITLE	Preliminary Marine Assessment
PROJECT NUMBER	0749798
DATE	17 December 2024
VERSION	Final
AUTHOR	Dan Burns, Delilah Ottley
CLIENT NAME	Great Eastern Offshore Wind Farm Project Co Pty Ltd

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
Draft	01	D. Burns; D. Ottley;	B. Parnum	J. Luk	25.10.2024	For client review
Draft	02	D. Burns; D. Ottley;	G. Murray	J. Luk	28.11.2024	For client review
Final	03	D. Burns; D. Ottley	G. Murray	J. Luk	17.12.2024	For client review

Great Eastern Offshore Wind

Preliminary Marine Assessment Report

0749798



Dan Burns

Managing Consultant



Jenny Luk

Partner

Environmental Resources Management
Australia Pty Ltd
Level 14, 207 Kent Street
Sydney NSW 2000

CONTENTS

EXECUTIVE SUMMARY	5
1. INTRODUCTION	8
1.1 PROJECT OVERVIEW	8
1.2 SCOPE AND PURPOSE OF THIS REPORT	8
1.3 LEGISLATIVE CONTEXT	10
2. PROJECT DESCRIPTION	14
2.1 OWF SITE (COMMONWEALTH WATERS)	15
2.1.1 Offshore Turbines	15
2.1.2 Offshore Turbine Foundations	15
2.1.3 Inter-array Cables	16
2.1.4 Offshore Substations	16
2.2 OFFSHORE CABLE ENVELOPE (COMMONWEALTH WATERS) AND NEARSHORE CABLE ENVELOPE (STATE WATERS)	17
2.2.1 Offshore Export Cables	17
2.2.2 Shore Crossing	17
2.3 ANCILLARY COMPONENTS	18
2.4 CONSTRUCTION ACTIVITIES	18
2.4.1 OWF Site (Commonwealth waters)	18
2.4.2 Offshore Cable Envelope (Commonwealth waters) and Nearshore Cable Envelope (State waters)	21
2.4.3 Offshore Export Cables	21
2.4.4 Installation Vessels	21
2.5 OPERATIONAL ACTIVITIES	22
2.6 DECOMMISSIONING ACTIVITIES	22
2.7 PROJECT TIMEFRAMES	23
3. METHODOLOGY	24
3.1 DESKTOP REVIEW	24
3.2 PRELIMINARY ASSESSMENT	26
4. DESCRIPTION OF THE EXISTING ENVIRONMENT	28
4.1 REGIONAL SETTING	28
4.2 PHYSICAL ENVIRONMENT	28
4.2.1 Bathymetry and Seabed Morphology	28
4.2.2 Seabed Geology	29
4.2.3 Coastal Morphology	29
4.2.4 Oceanography	33
4.2.5 Coastal Acid Sulfate Soils	36
4.3 BENTHIC HABITATS AND COMMUNITIES	36
4.3.1 OWF Site	37
4.3.2 Offshore Cable Envelope (Commonwealth waters)	37
4.3.3 Nearshore Cable Envelope (State waters)	37
4.4 FISH COMMUNITIES	43
4.5 MARINE AND COASTAL PROTECTED AREAS	43
4.5.1 Australian Marine Parks	47
4.5.2 State Marine and Coastal Protected Areas	47

4.5.3	Important Wetlands	50
4.6	MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	57
4.6.1	Summary of Matters of National Environmental Significance	58
4.6.2	Ramsar Wetlands	59
4.6.3	Commonwealth Marine Area	60
4.6.4	Threatened Ecological Communities	60
4.6.5	Threatened and Migratory Species	62
4.7	STATE BIODIVERSITY VALUES	99
4.7.1	Native Vegetation	99
4.7.2	Threatened Ecological Communities	99
4.7.3	Threatened Species	100
4.8	SOCIO-ECONOMIC ENVIRONMENT	107
4.8.1	Coastal Communities	107
4.8.2	Commercial Fisheries	107
4.8.3	Water Bodies Used for Beneficial Purposes	110
4.8.4	Aquaculture	110
4.8.5	Shipping and Navigation	110
4.8.6	Defence	113
4.8.7	Civil Aviation	116
4.8.8	Radar	116
4.8.9	Tourism and Recreation	119
4.8.10	Existing Offshore Infrastructure	121
4.8.11	Proposed Offshore Infrastructure	121
5.	PRELIMINARY ASSESSMENT	124
5.1	IDENTIFICATION OF POTENTIAL EFFECTS AND MITIGATION	124
5.1.1	Activities in Commonwealth waters	125
5.1.2	Activities in Victorian coastal waters	132
5.2	LIKELIHOOD OF OCCURRENCE ASSESSMENT	136
5.3	POTENTIAL FOR SIGNIFICANT IMPACTS ON MNES	137
5.3.1	Wetlands of International Importance (Ramsar Wetlands)	138
5.3.2	Critically Endangered and Endangered Ecological Communities	143
5.3.3	Listed Threatened Species	143
5.3.4	Listed Migratory Species	178
5.3.5	Commonwealth Marine Area	178
5.4	EES REFERRAL CRITERIA	184
6.	PROPOSED PROGRAM OF INVESTIGATIONS	199
6.1	BASELINE STUDIES AND IMPACT STUDIES	199
7.	CONCLUSION	202
8.	REFERENCES	203

APPENDIX A EPBC ACT PROTECTED MATTERS SEARCHES

APPENDIX B COMMERCIAL FISHERIES POTENTIALLY ACTIVE WITHIN THE OWF SITE AND CABLE ENVELOPES

APPENDIX C LIKELIHOOD OF OCCURRENCE: LISTED THREATENED ECOLOGICAL COMMUNITIES AND LISTED THREATENED / MIGRATORY SPECIES

LIST OF TABLES

TABLE 1-1	LEGISLATION RELEVANT TO MARINE COMPONENTS OF THE PROJECT	10
TABLE 3-1	DATABASES AND DESKTOP SEARCH TOOLS	25
TABLE 4-1	BENTHIC HABITATS AND BIOTOPE RECORDS WITHIN THE OWF SITE AND CABLE ENVELOPES (SOURCE: COASTKIT – VICTORIAN BIOTOPE ATLAS)	38
TABLE 4-2	SUMMARY OF MARINE AND COASTAL PROTECTED AREAS IN THE VICINITY OF THE OWF SITE AND CABLE ENVELOPES.	44
TABLE 4-3	SUMMARY OF PROTECTED WETLANDS IN THE VICINITY OF THE OWF SITE AND CABLE ENVELOPES.	51
TABLE 4-4	SUMMARY OF CRITICAL COMPONENTS AND PROCESSES FOR THE CORNER INLET RAMSAR SITE	53
TABLE 4-5	SUMMARY OF CRITICAL COMPONENTS AND PROCESSES FOR THE GIPPSLAND LAKES RAMSAR SITE	55
TABLE 4-6	SUMMARY OF MNES WITHIN THE OWF SITE AND CABLE ENVELOPES	58
TABLE 4-7	EPBC ACT-LISTED THREATENED AND MIGRATORY BIRD SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	64
TABLE 4-8	SEABIRD BIAS WITHIN THE OWF SITE AND CABLE ENVELOPES	71
TABLE 4-9	EPBC ACT-LISTED THREATENED AND MIGRATORY CETACEAN SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	79
TABLE 4-10	CETACEAN BIAS WITHIN THE OWF SITE AND CABLE ENVELOPES	80
TABLE 4-11	PINNIPED SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	88
TABLE 4-12	EPBC ACT-LISTED THREATENED AND MIGRATORY TURTLE SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	92
TABLE 4-13	EPBC ACT-LISTED FISH SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	96
TABLE 4-14	SHARK BIAS WITHIN THE OWF SITE AND CABLE ENVELOPE	97
TABLE 4-15	FFG ACT-LISTED THREATENED BIRD SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	101
TABLE 4-16	FFG ACT-LISTED THREATENED CETACEAN SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	105
TABLE 4-17	FFG ACT-LISTED PINNIPED SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	105
TABLE 4-18	FFG ACT-LISTED THREATENED TURTLE SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	106
TABLE 4-19	FFG ACT-LISTED FISH SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES	106
TABLE 5-1	IDENTIFICATION OF POTENTIAL EFFECTS AND KEY MITIGATION MEASURES – COMMONWEALTH ACTIVITIES	125
TABLE 5-2	IDENTIFICATION OF POTENTIAL EFFECTS AND KEY MITIGATION MEASURES – VICTORIAN COASTAL WATERS ACTIVITIES	132
TABLE 5-3	LIKELIHOOD OF OCCURRENCE ASSESSMENT CRITERIA AND RATINGS	136
TABLE 5-4	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: RAMSAR WETLANDS	139
TABLE 5-5	CRITICALLY ENDANGERED AND ENDANGERED BIRD SPECIES RELEVANT TO THE ASSESSMENT	143
TABLE 5-6	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: CRITICALLY ENDANGERED AND ENDANGERED BIRD SPECIES	144
TABLE 5-7	VULNERABLE BIRD SPECIES RELEVANT TO THE ASSESSMENT	152
TABLE 5-8	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE BIRD SPECIES	153
TABLE 5-9	CRITICALLY ENDANGERED AND ENDANGERED MARINE MAMMAL SPECIES RELEVANT TO THE ASSESSMENT	157
TABLE 5-10	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: CRITICALLY ENDANGERED AND ENDANGERED MARINE MAMMALS	158

TABLE 5-11	VULNERABLE MARINE MAMMAL SPECIES RELEVANT TO THE ASSESSMENT	164
TABLE 5-12	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE MARINE MAMMALS	164
TABLE 5-13	CRITICALLY ENDANGERED AND ENDANGERED TURTLE SPECIES RELEVANT TO THE ASSESSMENT	167
TABLE 5-14	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: CRITICALLY ENDANGERED AND ENDANGERED TURTLE SPECIES	167
TABLE 5-15	VULNERABLE TURTLE SPECIES RELEVANT TO THE ASSESSMENT	170
TABLE 5-16	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE TURTLE SPECIES	171
TABLE 5-17	VULNERABLE FISH SPECIES RELEVANT TO THE ASSESSMENT	172
TABLE 5-18	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE FISH SPECIES	173
TABLE 5-19-	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: MIGRATORY SPECIES	179
TABLE 5-20	PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: COMMONWEALTH MARINE AREA	181
TABLE 5-21	EES REFERRAL CRITERIA – INDIVIDUAL POTENTIAL ENVIRONMENTAL EFFECTS	185
TABLE 5-22	EES REFERRAL CRITERIA – COMBINATION OF ENVIRONMENTAL EFFECTS	191
TABLE 6-1	RECOMMENDED BASELINE STUDIES	199
TABLE 6-2	RECOMMENDED IMPACT STUDIES	200

LIST OF FIGURES

FIGURE 1-1	PROJECT LOCATION	9
FIGURE 2-1	CONCEPTUAL PROJECT DESIGN AND LAYOUT	14
FIGURE 2-2	INDICATIVE PROJECT TIMEFRAME	23
FIGURE 4-1	BATHYMETRY	31
FIGURE 4-2	GEOMORPHIC FEATURES	32
FIGURE 4-3	ANNUAL MEAN WIND SPEED AT 150M ALTITUDE	35
FIGURE 4-4	BENTHIC HABITATS AND COMMUNITIES	42
FIGURE 4-5	MARINE AND COASTAL PROTECTED AREAS	46
FIGURE 4-6	SEABIRDS	72
FIGURE 4-7	SHOREBIRDS	73
FIGURE 4-8	ORANGE-BELLIED PARROTS	76
FIGURE 4-9	BLUE WHALES AND PYGMY BLUE WHALES	81
FIGURE 4-10	SOUTHERN RIGHT WHALES	83
FIGURE 4-11	WHITE SHARKS – BIOLOGICALLY IMPORTANT AREAS	98
FIGURE 4-12	SHIPPING AND NAVIGATION	112
FIGURE 4-13	DEFENCE	115
FIGURE 4-14	CIVIL AVIATION	118
FIGURE 4-15	PARKS, RESERVES AND OTHER RECREATIONAL VALUES	120
FIGURE 4-16	EXISTING OFFSHORE INFRASTRUCTURE	122
FIGURE 4-17	PROPOSED OFFSHORE ELECTRICITY INFRASTRUCTURE	123

EXECUTIVE SUMMARY

Corio Generation (Corio) is proposing to develop the Great Eastern Offshore Wind (GEOW, or the "Project") in Commonwealth waters offshore in Gippsland, Victoria. Corio will lead and develop the Project through its project entity Great Eastern Offshore Wind Farm Project Co Pty Ltd (ACN 664 379 168) as trustee of the Great Eastern Offshore Wind Farm Asset Trust (the Proponent).

The Project Area comprises the following key components:

- Offshore Wind Farm (OWF) Site (667 km²), located in Commonwealth waters, where the offshore turbines, substations and inter-array cabling will be located.
- Offshore Cable Envelope (148 km²), located in Commonwealth waters.
- Nearshore Cable Envelope (20 km²), located in State waters.
- Onshore Transmission Envelope (31 km²), located inland, where onshore export cables will be installed between the landfall Transition Joint Bay (TJB) and VicGrid's Coordinated Connection Point.

This Preliminary Marine Assessment Report provides a summary of the existing environment, as relevant to the OWF Site and the offshore and nearshore cable envelopes and presents the results of a preliminary impact assessment.

SUMMARY OF ACTIVITIES IN THE COMMONWEALTH MARINE AREA

The project activities proposed in the Commonwealth Marine Area within the OWF Site and the offshore cable envelope are:

- Construction and installation of project infrastructure within the OWF Site (e.g., turbines, inter-array cables and substation), including:
 - Survey and site clearance;
 - Installation of ancillary components, including navigational aids;
 - Preparation of the seabed (including the depositing of materials/re-location and placement of materials);
 - Transport of turbines, offshore substation topsides and foundations to marshalling site;
 - Installation of offshore foundations;
 - Installation of turbine and offshore substation substructures on foundations;
 - Installation of scour protection, as required;
 - Pre-trenching and simultaneous laying and burial of the inter-array cables using a cable plough or trenching remotely operated vehicle (ROV);
 - Laying of cable protection, as required; and
 - Testing and commissioning.
- Construction and installation of the offshore export cable within the Offshore Cable Envelope, including:
 - Installation of ancillary components, such as navigational aids;
 - Preparation of the seabed (including some limited levelling as necessary), within a disturbance corridor of up to 1.6 km in width for the final cable system, including buffer for construction activities;
 - Installation of the offshore export cable using a cable plough or trenching ROV;

- Laying of cable protection (concrete mattresses, rock placement, grout bags, rock filled gabion bags etc.), as required;
- Cable bridge to support crossings of existing cables or pipelines offshore; and
- Crossings with other infrastructure (e.g. Basslink HVDC interconnector and Tasmanian Gas Pipeline) may be required.
- Vessel activities to support construction and maintenance activities, including:
 - Jack-up vessels;
 - Heavy lift barges; and
 - Cable laying vessels.
- Operation and maintenance activities in Commonwealth waters, including:
 - Wind farm operations;
 - Inspections, testing and maintenance of infrastructure, including turbines, foundations, cable routes and substations;
 - Vessel and vehicle access associated with the above activities; and
 - Offshore technical (e.g. detailed geophysical and geotechnical, ROV/camera/drone) surveys and environmental surveys.
- Decommissioning activities in Commonwealth waters in accordance with the *Offshore Electricity Infrastructure Act 2021*, e.g.:
 - Removal of infrastructure as required;
 - Reinstatement/rehabilitation activities; and
 - Mitigation and monitoring.

POTENTIAL IMPACTS IN THE COMMONWEALTH MARINE AREA

The preliminary assessment of the Project's potential impacts on matters of national environmental significance identified the following potentially significant impacts:

- Listed Threatened and Migratory bird species – collision risk and potential barrier effects from operating turbines could impact on populations and areas occupied by seabirds such as albatrosses and petrels, migratory shorebirds and migratory land birds.
- Listed Threatened and Migratory marine mammals – potential impacts from underwater noise disturbance during construction, including to foraging pygmy blue whales and migrating/resting/breeding southern right whales.
- Listed Threatened and Migratory fish species – potential impacts on white sharks within the breeding (nursery) BIA from underwater noise and vibration during construction activities.
- Commonwealth Marine Area – potential adverse effects on populations of marine species, specifically seabirds, shorebirds, migratory land birds, pygmy blue whales, southern right whales and white shark.

With the implementation of appropriate management and mitigation measures, potential impacts to MNES can be managed to an acceptable level.

A referral for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is recommended.

SUMMARY OF ACTIVITIES IN VICTORIAN COASTAL WATERS

The project activities proposed in Victorian coastal waters within the nearshore cable envelope include:

- Construction activities
 - Preparation of the seabed (including some limited levelling as necessary);
 - Installation of the offshore export cable using a cable plough or trenching ROV;
 - Laying of cable protection (concrete mattresses, rock placement, grout bags, rock filled gabion bags, etc.), as required;
 - Vessel movements – cable laying vessels; and
 - Within the cable breakout section, horizontal directional drilling and cable pull activities.
- Operations and maintenance activities
 - Cable inspections, testing and maintenance – over operational life of the wind farm (30-40 years).
- Decommissioning activities in accordance with the *Offshore Electricity Infrastructure Act 2021*, e.g.:
 - Removal of infrastructure as required.
 - Reinstatement/rehabilitation activities.
 - Mitigation and monitoring.

POTENTIAL IMPACTS IN VICTORIAN COASTAL WATERS

The potential effects of project activities in Victorian coastal waters on marine environmental values within the Victorian jurisdiction were assessed against the EES referral criteria in the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (8th edition, DTP 2023). The self-assessment indicated that the potential effects of the Project on environmental values within Victoria are unlikely to meet the thresholds defined in the referral criteria.

Given the location of the OWF Site (18 km from the State waters boundary), direct impacts from construction and operation of the turbines would not occur to values within Victorian coastal waters. Potential indirect impacts from activities in Commonwealth waters on Victorian matters have also been assessed as unlikely to trigger the EES referral criteria. It is also expected that any potential for indirect effects would be assessed in detail and managed through the referral and assessment process under the EPBC Act.

Direct impacts from cable installation activities and operations within the State jurisdiction have also been assessed as unlikely to trigger the EES referral criteria. However, as a precautionary approach, a referral for assessment under the *Environment Effects Act 1978* (EE Act) is recommended. Regardless of the Victorian Minister's decision on assessment requirements under the EE Act, the Project will still need to consider the broader environmental context of the Project, the potential for impacts and the development of relevant mitigation measures against all relevant State and Commonwealth legislation.

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Corio is proposing to develop the Project in Commonwealth waters off the Gippsland coast. Corio will lead and develop the Project through its project entity Great Eastern Offshore Wind Farm Project Co Pty Ltd (ACN 664 379 168) as trustee of the Great Eastern Offshore Wind Farm Asset Trust (the Proponent).

The Project Area comprises the following key components, as presented in **Figure 1-1**:

- Offshore Wind Farm (OWF) Site (667 km²), located in Commonwealth waters, where the offshore turbines, substations and inter-array cabling will be located.
- Offshore Cable Envelope (148 km²), located in Commonwealth waters.
- Nearshore Cable Envelope (20 km²), located in State waters.
- Onshore Transmission Envelope (31 km²), located inland, where onshore export cables will be installed between the landfall Transition Joint Bay (TJB) and VicGrid's Coordinated Connection Point.

1.2 SCOPE AND PURPOSE OF THIS REPORT

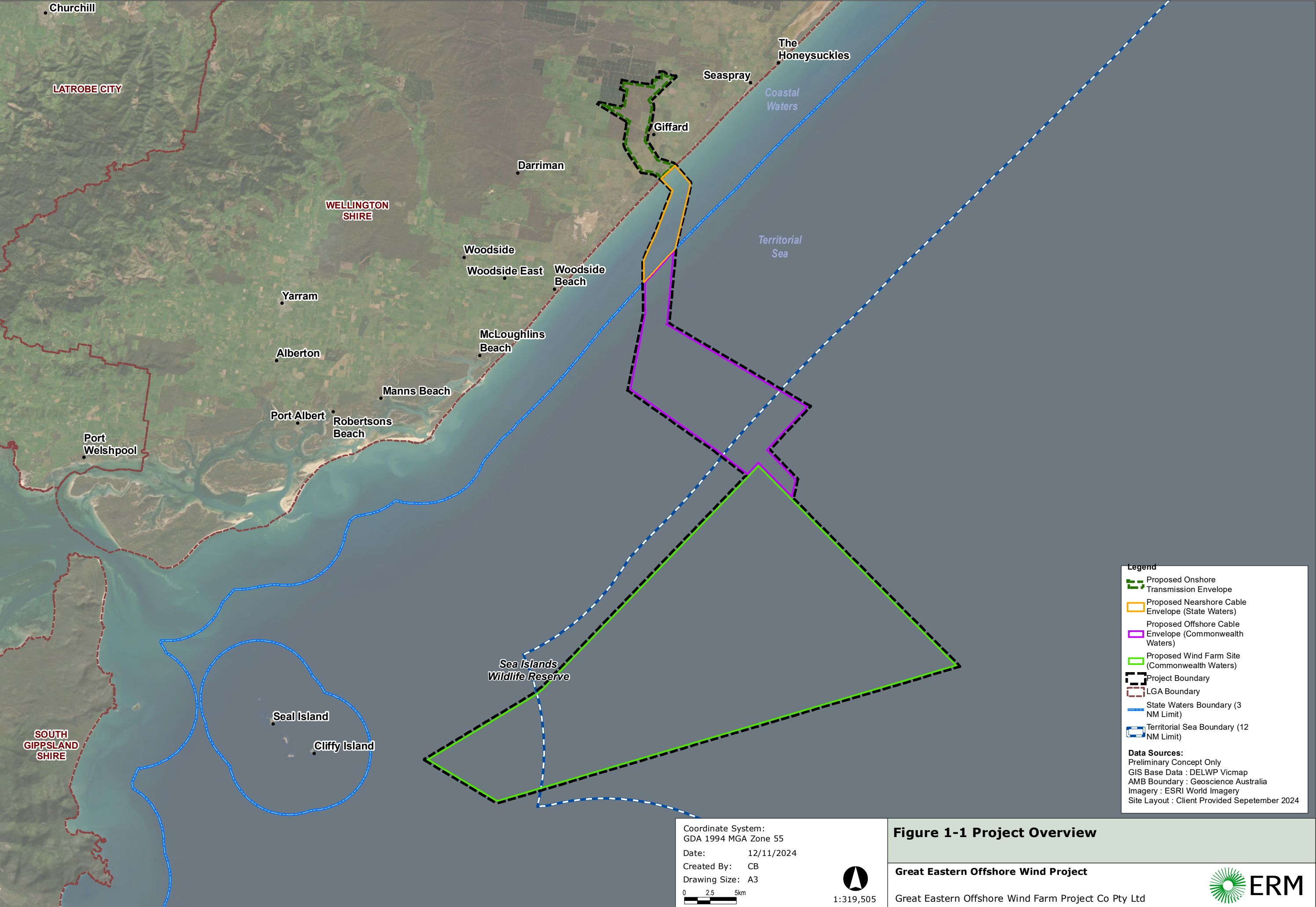
This preliminary marine assessment report presents the results of a review of the marine environmental and social features and sensitivities that are relevant to the Offshore Cable Envelope and Nearshore Cable Envelope (cable envelopes) and OWF Site. The report also provides a preliminary assessment of the potential impacts of the Project on these marine features and sensitivities.

The purpose of this report is to:

- Identify key potential marine environmental impacts associated with the Project;
- Identify implications of the findings under relevant Commonwealth and state legislation; and
- Recommend next steps for the marine assessments and approvals process.

This Preliminary Marine Assessment Report considers potential impacts resulting from the offshore components of the Project in Commonwealth and state waters, including the cable shore crossing points and the intertidal zone up to the Highest Astronomical Tide (HAT) boundary¹.

¹ A preliminary assessment of the potential impacts of the Project on terrestrial ecology is included in the GEOW Preliminary Terrestrial Ecology Report (ERM, 2024a).



1.3 LEGISLATIVE CONTEXT

Table 1-1 summarises the key Commonwealth and state legislation relevant to the assessment and management of potential impacts of the Project on the marine environment. Where legislation prescribes required standards or control measures to mitigate potential impacts, these have been considered in the preliminary impact assessments undertaken in **Section 5**.

TABLE 1-1 LEGISLATION RELEVANT TO MARINE COMPONENTS OF THE PROJECT

Legislation	Description	Relevance to Project
Commonwealth Legislation		
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	<p>Provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as MNES.</p> <p>In addition, management plans, recovery plans and conservation advice are established in relation to species, ecological communities and protected areas/properties listed under the EPBC Act.</p> <p>Administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW).</p>	<p>The preliminary assessment in this report has considered the MNES that could be directly or indirectly impacted by the Project. The outcomes of the assessment are detailed in Section 5.2 of this report.</p> <p>MNES of relevance to this report include:</p> <ul style="list-style-type: none"> • Ramsar Wetlands • Commonwealth Marine Area • Threatened Ecological Communities • Threatened and Migratory Species • Commonwealth marine areas
<i>Offshore Electricity Infrastructure Act 2021</i> (OEI Act)	<p>Sets out a licensing and regulatory framework for the construction, installation, operation, maintenance and decommissioning of offshore renewable energy and offshore electricity transmission infrastructure; and applies to offshore locations in Commonwealth waters.</p> <p>Administered by the Offshore Infrastructure Registrar (OIR).</p>	<p>Prior to commencing offshore infrastructure activities, a licence holder is required to submit a management plan to the OIR for assessment.</p>
<i>Australian Maritime Safety Authority Act 1990</i>	<p>Promotes maritime safety and protects the marine environment from pollution from ships and other environmental damage caused by shipping. Provides for a national search and rescue service and facilitates the preparation and response to marine pollution events such as oil spills.</p> <p>Administered by the Commonwealth Australian Maritime Safety Authority (AMSA).</p>	<p>Response to marine pollution events from vessels associated with the Project would be undertaken in accordance with the National Plan for Maritime Emergencies (NATPLAN). All vessels used by the Project will need to comply with AMSA requirements for safety.</p>

Legislation	Description	Relevance to Project
<i>Biosecurity Act 2015</i>	<p>Regulates and manages biosecurity threats to Australia, including management of vessel ballast water and biofouling to prevent the introduction, establishment or spread of diseases or pests (e.g., invasive marine species (IMS)).</p> <p>Administered by the Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF).</p>	<p>The Project is required to implement control measures that reduce the likelihood of the introduction and establishment of IMS. The Act will guide requirements for incoming vessels (or other goods and services) required for the Project, including Ballast water management in accordance with Australian Ballast Water Management Requirements.</p>
<i>Navigation Act 2012</i>	<p>Regulates ship and seafarer safety and shipping aspects of protecting the marine environment in Australian waters. The Act (in combination with other legislation such as the <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i> gives effect to relevant international conventions to which Australia is a signatory (e.g., Convention on the International Regulations for Preventing Collisions at Sea (COLREGS), International Convention for the Safety of Life at Sea (SOLAS)). The Act also has subordinate legislation contained in Regulations and Marine Orders.</p> <p>Administered by AMSA.</p>	<p>Several Marine Orders are enacted under this Act that will apply to Project vessels, including but not limited to:</p> <ul style="list-style-type: none"> • Marine Order 21: Safety and emergency arrangements • Marine Order 27: Safety of navigation and radio equipment • Marine Order 30: Prevention of collisions • Marine Order 31: SOLAS and non-SOLAS certification • Marine Order 58: Safe management of vessels
<i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i>	<p>Relates to the protection of the sea from pollution by air emissions, oil, sewage, waste and other substances discharged from vessels, and gives effects to certain requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL).</p> <p>Administered by AMSA.</p>	<p>Several Marine Orders are enacted under this Act that will apply to Project vessels, including but not limited to:</p> <ul style="list-style-type: none"> • Marine order 91: Marine pollution prevention—oil • Marine order 95: Marine pollution prevention—garbage • Marine order 96: Marine pollution prevention—sewage • Marine order 97: Marine pollution prevention—air pollution • Marine order 98: Marine pollution—anti-fouling systems
<i>Fisheries Administration Act 1991</i>	<p>Relates to the management of Australian (Commonwealth managed) fisheries.</p> <p>Administered by the Australian Fisheries Management Authority (AFMA).</p>	<p>Of particular relevance to the Project is the allocation of fishing rights and management areas. Commonwealth managed fisheries relevant to the Project are summarised in Section 4.8.2.</p>
<i>Underwater Cultural Heritage Act 2018</i>	<p>Protects the heritage values of underwater cultural heritage and relics of older than 75 years, including shipwrecks, sunken aircraft and other types of underwater cultural heritage.</p>	<p>Project activities are required to not disturb or damage underwater heritage and to observe the requirements of protected zones. Potential impacts are considered in the Great Eastern Offshore Wind:</p>

Legislation	Description	Relevance to Project
	Administered by DCCEEW.	Heritage Constraints Assessment (ERM, 2024b)
<i>Environment Protection (Sea Dumping) Act 1981</i>	<p>Regulates the loading and dumping of waste at sea; and also fulfils Australia's international obligations under the London Protocol to prevent marine pollution by controlling dumping of wastes and other matter.</p> <p>Administered by DCCEEW.</p>	<p>Permits are required from DCCEEW for all ocean disposal activities such as cable burial using manupported materials (rock for armour/cable protection, etc).</p> <p>In the event that any Project infrastructure remains in-situ at the end of its use, a Sea Dumping Permit may be required.</p> <p>DCCEEW is currently reviewing its regulatory arrangements for abandonment of offshore infrastructure and considers proposals to abandon infrastructure at sea on a case-by-case basis.</p>
State Legislation		
<i>Environment Effects Act 1978</i>	<p>Establishes a process for assessing the potential environmental effects of a proposed development and enables statutory decision-makers to determine whether a project with potentially significant environmental effects should proceed.</p> <p>Administered by the Department of Transport and Planning (DTP).</p>	The preliminary assessment in this report has considered referral criteria and matters protected by the state that could be directly or indirectly impacted by the Project. The outcomes of the assessment are detailed in Section 5.4 of this report.
<i>Environment Protection Act 2017</i>	<p>The purpose of the legislation is to enhance protection of Victoria's environment and human health through a proportionate, risk-based environment protection framework.</p> <p>Administered by the Environment Protection Authority (EPA) Victoria.</p>	The Project has a general environmental duty to reduce the risk of harm from its activities to human health and the environment from pollution or waste.
<i>Flora and Fauna Guarantee Act 1988</i>	<p>Establishes a legal and administrative structure to enable and promote the conservation of native flora and fauna and to provide for a choice of procedures which can be used for the conservation, management or control of flora and fauna and the management of potentially threatening processes.</p> <p>Administered by the Department of Energy, Environment and Climate Action (DEECA).</p>	The Project is required to assess the potential impacts on Threatened species and communities listed under the Act and the Project may require a Permit to Take Protected Flora/Fauna.
<i>Wildlife Act 1975</i>	Establishes procedures to protect and conserve wildlife, allows for the sustainable use of and access to wildlife; and regulates the conduct of persons engaged in wildlife related activities.	The Project may require authorisation for handling and managing fauna.

Legislation	Description	Relevance to Project
	Administered by DEECA.	
<i>Marine and Coastal Act 2018</i>	Provides an integrated approach to planning and managing the marine and coastal environment by enabling protection of the coastline and the ability to address the long-term challenges of climate change, population growth and ageing coastal structures. Administered by DEECA.	The Project will require consent to undertake works on marine and coastal Crown land and would be required to align with requirements of any local coastal and marine management plans applicable to the Project Area.
<i>National Parks Act 1975</i>	Provides for the establishment of national parks, state parks, marine national parks and coastal parks. Administered by DEECA.	The Project Area does not overlap with any marine national parks or coastal parks, however, a number of parks are in the broader vicinity (Section 4.5.2).
<i>Marine Safety Act 2010</i>	Provides for safe marine operations in Victoria amongst other provisions by imposing a range of safety duties, providing for the regulation and management of the use of, and navigation of vessels in state waters. Administered by Maritime Safety Victoria.	Project vessels are required to implement a range of safety duties, ensure masters are licensed and specific navigational and pilotage requirements are adhered to.
<i>Emergency Management Act 2013</i>	Establishes governance arrangements for emergency management in Victoria. Administered by Emergency Management Victoria.	The project's emergency management plans would be integrated with the governance arrangements described in the Act, as well as the NATPLAN.
<i>Pollution of Waters by Oil and Noxious Substances Act 1986</i>	Provides for the protection of the sea and certain waters from pollution by oil and other substances and to implement MARPOL. Administered by the EPA Victoria.	Project vessels are required to adhere to the requirements of this Act, including the implementation of MARPOL requirements.
<i>Fisheries Act 1995</i>	Provides a legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitats. Administered by the Victorian Fisheries Authority (VFA).	Of particular relevance to the Project is the allocation of fishing rights and management areas. Victorian managed fisheries relevant to the Project are summarised in Section 4.8.2 .
<i>Heritage Act 2017</i>	Provides for the protection and conservation of the non-Aboriginal heritage of Victoria, including shipwrecks and other heritage in marine and coastal waters. Administered by Heritage Victoria (DTP).	Project activities are required to not disturb or damage maritime heritage and to observe the requirements of protected zones. Potential impacts are considered in Great Eastern Offshore Wind: Heritage Constraints Assessment (ERM, 2024b)

2. PROJECT DESCRIPTION

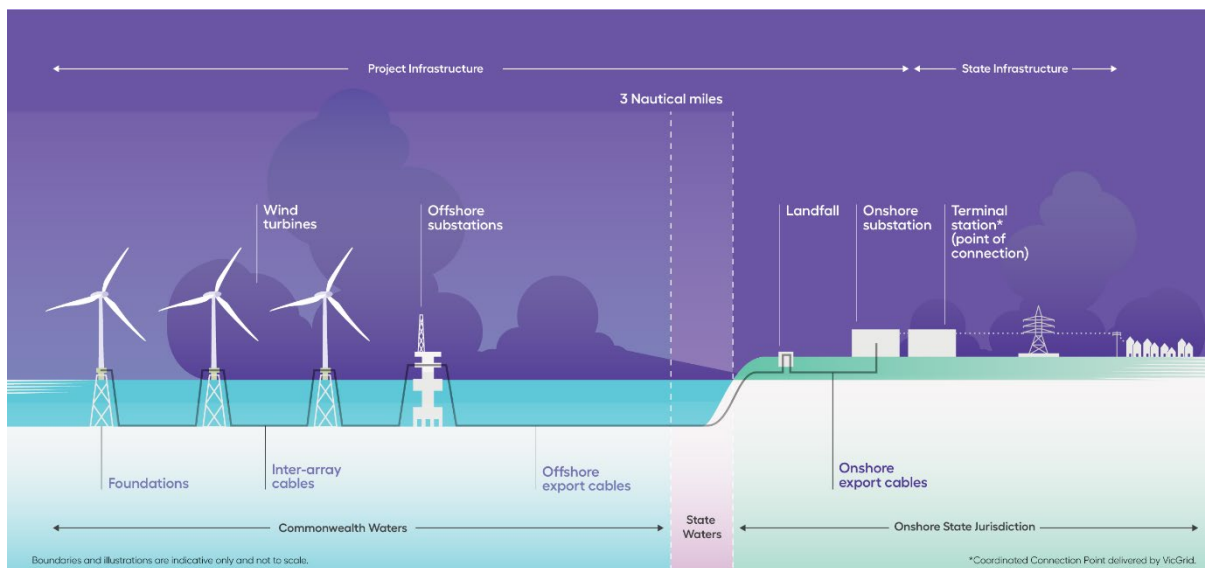
This section describes the Project, including the components that may be installed in the marine environment and at the shoreline.

The Project will be developed with a total nameplate capacity of approximately 2,500 megawatts (MW), subject to final project design and grid capacity, likely comprising a total of up to 172 turbines. Each turbine is envisaged to be installed on fixed-bottom offshore foundations. The Project will be developed in stages to align with the development of the industry and its supporting infrastructure.

The baseline electrical configuration envisaged for the Project is to be high voltage alternating current (HVAC), which will utilise inter array cables connected to offshore substations that will transform the voltage. Export cables from the offshore substations will export electricity to shore, connecting at the cable TJB at landfall. From the cable TJB, onshore export cables will carry the electricity to the grid via a connecting substation located at or close to the VicGrid Coordinated Connection Point.

A Project concept design visualisation is presented in **Figure 2-1** where the Project's onshore substation equipment is assumed to be located within VicGrid's Coordinated Connection Point.

FIGURE 2-1 CONCEPTUAL PROJECT DESIGN AND LAYOUT



The proposed Onshore Transmission Envelope is located within the Offshore Wind Energy Transmission area released by VicGrid in March 2024. Corio's base case will involve connecting into VicGrid's Coordinated Connection Point.

Depending on the final operations and maintenance strategy, a manned operation centre will be located near the operations and maintenance (O&M) port and/or in the onshore substation.

The Project design will be further developed in parallel with the results of environmental and technical feasibility studies, and stakeholder consultation, and will be confirmed during the pre-construction phase of the Project.

2.1 OWF SITE (COMMONWEALTH WATERS)

2.1.1 OFFSHORE TURBINES

It is proposed that up to 172 offshore turbines, with a maximum blade tip height of 375 m, will be installed in the OWF Site, depending upon turbine technology and capacity. At this stage, it is too early to specify which turbine technology will be used, as the ultimate choice of turbine will depend upon how technology evolves in the next few years, which manufacturer offers the most commercially and technically viable option, suitability of the technology for site specific conditions, capacity of available port services and construction support vessels and various environmental and social impact considerations.

Wind class helps in determining which turbine model will perform as the turbines are designed for optimal performance and reliability based on a specific class of wind and the kind of weather which it needs to endure in its lifetime. Across most turbine original equipment manufacturers (OEM), it is expected that class "International Electrotechnical Commission (IEC) Class I" turbines should be sufficient models as they are designed for a wind regime in line with offshore conditions. While turbine performance must be based on the specific wind regime at the site, it is anticipated that Class S I turbines will be available at procurement and be suitable for the site conditions found at GEOW.

Turbine spacing depends upon the turbine size and site-specific conditions. The layout of the OWF will be subject to further detailed design and will depend upon factors such as seabed conditions, wind conditions, energy generating efficiencies, and conditions of environmental approvals.

2.1.2 OFFSHORE TURBINE FOUNDATIONS

Generally, there are two groups of foundations for offshore wind: floating and fixed bottom. The selection of the type of foundation to be used in a project depends on the water depth at the selected site, with sites less than 70 m below MSL typically being able to use fixed-bottom foundations, and floating foundations most likely to be required beyond that depth. The water depths at the proposed site are less than 70 m MSL, so the use of fixed bottom foundations is envisaged. This is considered the most economical and cost-efficient solution for offshore wind projects at present.

There are several types of fixed bottom foundations, including monopile, suction bucket, jacket and gravity-based structures. Several factors affect the final selection of the foundation type including water depth and its variability across the site, seabed and metocean conditions and supply chain considerations. Detailed analysis and evaluation of the optimal solution for the Project will be undertaken following site investigation surveys and technical assessment of foundation concepts.

Structures placed on or in the seabed are exposed to a phenomenon called scour due to the natural acceleration of water around an obstacle and the consequent movement of seabed material due to those currents and wave actions. If required, scour protection will be considered when designing offshore turbine foundations.

2.1.3 INTER-ARRAY CABLES

The inter-array cables will be arranged in radial, branched and/or looped configuration to connect the offshore turbines and transmit the energy generated to the offshore substations. The array cables are likely to operate at a nominal Alternating Current (AC) voltage range of between 66 kV and 132 kV. Although 66 kV voltage is the current market practice, 132 kV array cables may present some upside potential depending on the progression of the cable and turbine industry. 132 kV presents the potential of reducing electrical losses, fewer cables and/or reduced cross sections required for the same capacity ratings.

The size of the cables will vary depending on the number of turbines it is connecting. The maximum conductor section or Cross-Sectional Area (CSA) is expected to be 630 to 1200 millimetres squared (mm²) but will ultimately be defined by the overall electrical system design and the design of the conductor itself.

Cables will be buried 0.5 to 5 m below stable seabed subject to geotechnical conditions and other offshore activities in the area such as fishing. Where burial is not possible, the cables will be surface laid with cable protection installed; for example, rock placement, rock filled gabion bags or concrete mattresses.

2.1.4 OFFSHORE SUBSTATIONS

The offshore substation serves as an interconnection point for the turbine strings. The functional capabilities of the offshore substation are housed in a 'topside' structure, elevated above the sea on a custom foundation. Offshore substations house other key electrical and auxiliary equipment, typically including switchgear, transformers, control systems, reactors, cranes, back-up power systems, a helipad, and amenities for operations & maintenance (O&M) teams.

The substation's primary function is to receive electricity from the inter-array cables and increase its voltage level using transformers from the inter-array cable voltage level to the export cable voltage level. This increase in voltage reduces electrical losses during transmission and minimises the number of circuits required to transport power to the onshore substation. The offshore substation also facilitates redundancy with the inter-array system, by providing a point where separate circuits can be interconnected with normally open contactors.

The requirement for and number of offshore substations to be installed will be determined later in the development of the Project and will depend on, amongst other factors, the final number of turbines and their capacity rating, the voltage used in the array cabling system and the specific site conditions. Increasing the export voltage can increase the capacity of each HVAC circuit and substation. However, current assumptions for the Project are that up to eight substations are likely to be required depending on the size of the substation selected.

The offshore substation(s) will transform the array voltage (anticipated to range from 66 kV to 132 kV) to a higher voltage (anticipated to range from 220 kV to 500 kV for an HVAC setup) for transmission to shore using export cables.

Each of the offshore substations will comprise a platform with one or more decks/platforms, with a foundation installed on the seabed. For smaller sized offshore substations, the same foundations for the substations and turbines will most likely be used for ease of supply chain

and manufacturing logistics. For larger substations, bespoke jacket foundations (likely to have in the range of 3-6 legs) or monopile foundations will be used.

2.2 OFFSHORE CABLE ENVELOPE (COMMONWEALTH WATERS) AND NEARSHORE CABLE ENVELOPE (STATE WATERS)

2.2.1 OFFSHORE EXPORT CABLES

Within the Offshore and Nearshore Cable Envelope, high voltage cables are used to transfer electricity from the offshore substation to a landfall site, following a pre-defined cable corridor which is designed to be as short as possible whilst minimising its impact on the surrounding environment and other marine users. The cable corridor will consist of a cable system that is expected to consist of up to eight HVAC cable circuits with an operational voltage level of 220 kV to 500 kV. Each cable will contain three power cores and fibre optics for communications. The cable corridor is expected to be up to 2km wide. Within the Offshore and Nearshore Cable envelope, there will be approximately 1.6 km width of disturbance corridor which will likely be occupied by the final cable system, including buffer for construction activities.

Similar to inter array cables, offshore export cables are typically buried about 0.5 to 5 m below the seabed. In the Nearshore Cable Envelope area, as export cables approach landfall, the cables could be installed deeper as they approach and enter the horizontal directional drilling ducts (if this horizontal directional drilling method is used for the shore crossing). Cable burial risk assessments will be conducted prior to installation to determine the appropriate burial depth. Where burial is not feasible, rock placement, rock filled gabion bags or concrete mattresses will be placed over exposed or shallow areas of cable to increase protection.

Export cables are typically installed within a designated corridor and are separated from each other to allow for repairs, if required. The cable separation may change along the cable corridor due to constraints along the route, the need for additional manoeuvrability during installation, and the use of different burial methods which can also affect the separation. This aspect is to be further considered during the design phase when cable sizing studies are expected to be carried out. Where parallel export cable routes are highly constrained or considered to be exposed to higher risk levels from fishing or shipping activities, they may be routed differently to achieve the lowest impact and lowest risk of future damage.

2.2.2 SHORE CROSSING

The method employed for export cable shore crossings will depend upon the coastal morphology and geology. At this stage horizontal directional drilling (HDD) is the preferred method. Several shore crossing locations are currently under consideration. In cliff related coastal settings, HDD may be undertaken to create the cable shore crossing conduits, HDD may also be undertaken beneath areas of sensitive coastal habitats or morphology, where direct surface disturbance to the intertidal area is specifically required to be avoided. However, HDD may not always be technically feasible and may require a longer period to prepare the shore crossing compared to direct methods of installation such as open trenching, ploughing or chain/wheel cutting (or a combination). Depending on offshore seabed conditions (geology and morphology), some preparatory works may be required to enable successful installation of the cables. Details will be determined following a detailed site investigation, engineering, and

environmental studies and once export cable routes and shore crossing locations have been defined.

2.3 ANCILLARY COMPONENTS

Ancillary components may be required to support the feasibility studies, construction and operational phases of the Project.

The likely offshore ancillary components include:

- Meteorological and oceanographic monitoring devices in Commonwealth and/or state waters (e.g., floating LiDAR, wave buoys, seabed-based profilers), preliminary geophysical and geotechnical investigations during early Project investigations (note, these activities are the focus of a separate referral);
- Navigational aids in Commonwealth and/or state waters; and
- Safety zones (navigation buoys) may be established around offshore turbines and offshore substations in Commonwealth waters in accordance with the OEI Act, though this will be confirmed with the Offshore Infrastructure Regulator (OIR).

These offshore ancillary works do not form part of the referral and any approvals required to support these works would be secured under other permits/referrals.

2.4 CONSTRUCTION ACTIVITIES

Construction is anticipated to take approximately three to four years. The preliminary schedule for the Project identifies construction as occurring between 2028 and 2032. A summary of the key construction activities planned offshore and onshore is provided below.

2.4.1 OWF SITE (COMMONWEALTH WATERS)

Key construction activities planned to occur in the OWF Site include:

- Survey and site clearance;
- Installation of ancillary components, including navigational aids;
- Preparation of the seabed (including the depositing of materials/re-location and placement of materials);
- Transport of turbines, offshore substation topsides and foundations to marshalling site;
- Installation of offshore foundations;
- Installation of turbine and offshore substation substructures on foundations;
- Installation of scour protection, as required;
- Pre-trenching and simultaneous lay and burial of the inter-array cables using a cable plough or trenching remotely operated vehicle (ROV);
- Laying of cable protection, as required; and
- Testing and commissioning of the wind farm in stages.

2.4.1.1 OFFSHORE TURBINES

The turbines are comprised of a tower, nacelle, hub and blades, each of which are fabricated separately either in house by OEMs themselves or by specialist subcontractors.

Once the key components have been manufactured, they may be pre-assembled at a marshalling harbour to varying degrees of completion. Pre-assembly aims to minimise the number of offshore lifts and working time, such as by assembling the tower before load-out on the installation vessel.

2.4.1.2 FOUNDATIONS

Installation techniques vary depending on foundation type. These are described below for bottom-fixed concepts.

MONOPILES

The monopile is normally driven into the seabed using a large pile driving hammer suspended from the crane of a jack-up vessel or floating 'dynamically positioned vessel'. Once the monopile is installed, a transition piece structure which connects the monopile to the tower is lifted and installed onto the monopile. The two structures are connected either by a bolted flange connection or by a grouted annulus joint. As an alternative to the use of a large pile driving hammer, several innovative pile installation methods, such as hydro hammers and vibration-based piling, are currently being trialled in the industry.

PIN-PILED JACKET

Pin-piles are typically installed in the seabed at each offshore turbine location prior to the jacket arriving. This installation process is known as 'pre-piling' and it involves using a pile driving hammer. Although, other piling techniques such as hydro hammers and vibration-based piling, are currently being trialled. Alternatively, but less commonly, piles can be installed after jacket installation via pile sleeves (post-piling). ROVs are used to guide the foundations in place and monitor the grouting process. Jacket foundations for offshore wind turbines are typically three or four-legged structures and the final jacket geometry depends on site-specific conditions and supply chain requirements.

SUCTION BUCKET JACKET

Installation of suction bucket jackets is completed by lowering the structure on to the seabed, before pumping water out from the buckets at the feet of the jacket. Once the water from the buckets has been pumped out, the pressure differential between the inside of the bucket and the external water pressure secures the foundation to the seabed. ROVs are used to monitor the pumping process to analyse any potential anomalies in the installation process that may compromise the security of the foundation's fastening and position. Once enough water has been pumped from within the buckets to guarantee a suitable installation depth, valves are shut, hoses are removed, and the pumping process ceases.

GRAVITY BASE STRUCTURE

Gravity based structures (GBS) are typically fabricated at a quayside fabrication facility (e.g. a port) and manoeuvred at the quayside along the ground using rollers or other systems, and floated out to site and sunk into position prior to ballasting. Prior to sinking/ballasting the GBS, the seabed needs to be levelled, this typically involves ground preparation requiring a gravel or rock bed/pad to be built up. The immersion technique of installing the foundations generates minimal noise, and foundations can be fully decommissioned with minimal lasting effect on the

seabed or surrounding ecology. Site preparation is a critical element of the overall construction and installation of GBS.

WEIGHTED / GRAVITY BASED JACKETS

There are also some design concepts of weighted / gravity-based jackets (weighted bucket jackets) available however these are less commonly used.

2.4.1.3 INTER-ARRAY CABLES

Cable installation activities will be preceded with a cable route survey and clearance of any debris (e.g. boulders or small surface debris that could pose a challenge to cable installation).

Burial of the cables will provide protection to the cables where seabed characteristics allow. Cables are typically buried approximately 0.5 to 5.0 m below the seabed to ensure marine traffic such as fishing vessels or ship anchors do not damage the cable. Cable burial assessments are conducted prior to installation to determine the appropriate burial depth.

The method of cable burial is highly dependent on the nature and composition of the seabed. Pre-trenching, simultaneous lay and burial using a cable plough or post lay burial utilising a subsea trencher, plough or ROV are all well-established methods in the offshore renewables industry. In some cases, a combination of burial techniques may be required based on local seabed conditions.

At locations where it is not possible to bury cables (e.g., where the substrate or cable/pipeline crossings result in the cable being laid near to or on the seabed surface, or where cables enter the turbine or offshore substation platform) additional protection may be required, such as concrete mattresses, rock placement, grout bags, etc.

Crossings with other infrastructure (e.g. Basslink HVDC interconnector and Tasmanian Gas Pipeline) may be required. The design and methodology of these crossings will be confirmed in agreement with the asset owner. An example of a type of crossing is that a berm of rock will be placed over the existing asset for protection, known as a pre-lay berm, or separation layer. Project cables will then be laid across this, at an angle close to 90 degrees and then be covered by a second post lay berm to ensure that the inter array cable remains protected and in place.

2.4.1.4 OFFSHORE SUBSTATIONS

The foundation structure is normally transported to site by barge and lifted into place. In the case of a monopile, often the foundation installation vessel can be used, with installation following the same method used as a monopile foundation. For a jacket foundation normally a larger, specialist heavy-lift vessel will be required, typically pin piles will have been installed in advance though they might also be installed after the jacket is lifted into place (post piling).

For the topside module, it is normally loaded onto a barge (by either heavy-lift crane, Self-Propelled Modular Transporters (SPMTs), or through a "skidding" procedure) and towed to the offshore site where it will be installed onto the foundation using a specialist heavy-lift vessel.

2.4.2 OFFSHORE CABLE ENVELOPE (COMMONWEALTH WATERS) AND NEARSHORE CABLE ENVELOPE (STATE WATERS)

Key construction activities planned to occur include:

- Installation of ancillary components, such as navigational aids;
- Preparation of the seabed (including some limited levelling as necessary), within a disturbance corridor of up to 1.6 km in width for the final cable system, including buffer for construction activities;
- Installation of the offshore export cable using a cable plough or trenching ROV;
- Laying of cable protection (concrete mattresses, rock placement, grout bags, rock filled gabion bags etc.), as required;
- HDD / trenching / ploughing activities at shore crossing (state waters);
- Cable bridge to support crossings of existing cables or pipelines offshore; and
- Crossings with other infrastructure (e.g. Basslink HVDC interconnector and Tasmanian Gas Pipeline) may be required.

In addition, the Nearshore Cable Envelope will also include HDD / trenching / ploughing activities at the shore crossing.

2.4.3 OFFSHORE EXPORT CABLES

Export cable installation activities will be similar to the inter-array cable installation activities described above. Cables will either be buried (where the substrate is suitable) or cable protection used where the cable is laid on the seabed surface. Additional cable protection may be required depending on the burial depth and metocean conditions.

In shallow waters close to shore, the shore crossing will be achieved using an HDD spread, or pre-trenching/ploughing of the cable using a towed barge.

In the Nearshore Cable Envelope area, as export cables approach landfall, the cables could be installed deeper as they approach and enter the horizontal directional drilling ducts (if this horizontal directional drilling method is used for the shore crossing).

If trenching is required through the intertidal zone, a backhoe mounted on a shallow draft barge and small onshore excavator may be used. Specialised elevated marinised excavators may also be used where site conditions are suitable. Hopper barges would be used to dewater and transport any material to a suitable relocation site.

Crossings with other infrastructure (e.g. Basslink HVDC interconnector and Tasmanian Gas Pipeline) may be required. The design and methodology of these crossings will be confirmed in agreement with the asset owner. An example of a type of crossing is that a berm of rock will be placed over the existing asset for protection, known as a pre-lay berm, or separation layer. Project cables will then be laid across this, at an angle close to 90 degrees and then be covered by a second post lay berm to ensure that the export cable remains protected and in place.

2.4.4 INSTALLATION VESSELS

The type of installation vessels used varies per component being installed.

For offshore turbine and foundation installation, a jack-up vessel is normally utilised. These vessels provide a stable platform for the installation of foundations and turbine components via legs which lift the vessel above sea level. Operation of jack-up vessels are mainly constrained by the height of the legs, generally only suitable for water depths less than 50 m. For areas with greater water depths, a dynamic positioning system vessel, that automatically maintains position via propellers, and thrusters is considered best practice. For this Project, the use of a jack-up vessel and/or a dynamic positioning system vessel will be decided once the site conditions and supply chain constraints have been fully assessed.

For the offshore substation, installation is generally performed by heavy lift barges (also used in the oil and gas industry). These vessels are not equipped for prolonged installation periods, so substations are assembled onshore prior to installation. Though it is also possible to either use multiple smaller substations that would reduce the size of vessel needed to perform the lift, or to split the substation topside in 2 or more parts, again reducing the size of the vessel needed to perform the lift, (e.g. WTG or foundation installation vessels could be used).

For cable installation, specialised cable laying vessels are typically used. These vessels are also suited to activities outside of offshore wind as they can be used to lay other cable types such as electricity interconnectors and submarine communication cables. Accordingly, these installation vessels are in high demand and as such supply is constrained.

2.5 OPERATIONAL ACTIVITIES

The operational design life of the offshore wind farm is a minimum of 30 years, with the option to extend within the 40-year duration of a commercial licence under the OEI Act.

This phase will include operation and management of the Project, and periodic inspection and maintenance activities. Remote operational monitoring and environmental monitoring programs are also expected to be undertaken.

Periodic inspection and maintenance activities may include:

- Inspections, testing and maintenance of infrastructure, including turbines, foundations, cable routes and substations;
- Vessel and vehicle access associated with the above activities; and
- On and offshore technical (e.g. geophysical and geotechnical, ROV/Camera/Drone) surveys, Environmental surveys.

The specific methods and frequency of inspection and maintenance activities will be in accordance with the OEI Act, and is subject to detailed engineering design and the development of an inspection and maintenance program, such a program will be based on OEM operation and maintenance manuals and industry best practice.

2.6 DECOMMISSIONING ACTIVITIES

Requirements for decommissioning will be established through the approvals phase for the Project and the development of a Commercial Licence Decommissioning Management Plan. This Management Plan will address how infrastructure is to be removed in accordance with the OEI Act and regulations.

It is anticipated that decommissioning will include:

- Removal of infrastructure as required.
- Reinstatement/rehabilitation activities.
- Mitigation and monitoring.

2.7 PROJECT TIMEFRAMES

The indicative timeframe for the Project is presented in **Figure 2-2**.

FIGURE 2-2 INDICATIVE PROJECT TIMEFRAME



3. METHODOLOGY

This section describes the approach and methods used to develop this report. The report includes three key components:

1. Desktop review of available information, to provide a description of the existing marine environment relevant to the Project Area, as presented in **Section 4**.
2. Preliminary assessment of the potential for the Project to result in significant impacts on MNES protected under the EPBC Act, or to trigger EES criteria for matters protected in Victoria under the EE Act, as presented in **Section 5**.
3. A proposed program of investigations and consultation, as presented in **Section 6**.

Based on the outcomes of these tasks, key conclusions and recommendations for referral of the Projects for assessment under the EPBC Act and EE Act are provided in **Section 7**.

3.1 DESKTOP REVIEW

A desktop review has been undertaken to characterise the environmental and socio-economic existing environment relevant to the OWF Site and the cable envelopes, as presented in **Section 4**. The review included physical, biological, and socio-economic values and sensitivities, and summarised both Commonwealth MNES and state protected matters. Underwater cultural heritage values are considered in GEOW Preliminary Heritage Constraints Assessment (ERM 2024b).

Publicly accessible government databases and spatial data mapping tools, as summarised in **Table 3-1**, were examined to review and document the marine ecological, heritage and social values potentially present within the Project Area.

PMST and VBA searches were performed with a 10 km buffer applied to the boundaries of the OWF Site and to marine areas around each cable envelope (Appendix A), to ensure that key species habitats and biologically significant areas close to the Project were identified. Due to the spatial granularity of the data presented in these tools, as well as the 10 km search buffer, search results for marine areas included some terrestrial and freshwater species. To address this discrepancy, search areas were clipped to exclude mainland terrestrial areas where the 10 km buffer overlapped. However, some terrestrial mammals and other species not relevant to the marine assessment were still found during the searches. Therefore, information about habitat and migration behaviour were also considered to identify only marine species or terrestrial or freshwater species that are likely to be relevant to the marine environment and marine components of the project (e.g., Migratory land birds that may migrate over the sea, freshwater fish with a marine or coastal life stage). Terrestrial or freshwater species that are not relevant to the marine environment and were only featured in the search results as an artefact of spatial granularity and the 10 km search buffer have been excluded.

Owing to differences in the spatial coverage and number of records available in the marine environment in the PMST and the VBA, most listed Threatened or Migratory species were identified through the PMST, though some additional listed species were also identified using the VBA. Irrespective of which database a species was identified through, this report provides both the Commonwealth EPBC Act listing and Victorian FFG Act listing for each species, where applicable.

Separate searches were conducted for the Offshore Cable Envelope and Nearshore Cable Envelope and further interrogation of the PMST and VBA allowed for some differentiation between species potentially occurring in Commonwealth Waters compared with state waters. However, in many cases the species were the same due to the coarse spatial resolution of species distribution data in the PMST.

Spatial data associated with identified species, habitats or ecological communities was also sourced from www.data.gov.au and www.data.vic.gov.au. Spatial data has been reviewed using Geographic Information Systems (GIS) and included in maps presented within the report.

TABLE 3-1 DATABASES AND DESKTOP SEARCH TOOLS

Data Source	Description
National Databases	
EPBC Act PMST	The EPBC Act PMST provides predictive results of MNES based on mapping of known and potential species distributions, habitats, Threatened Ecological Communities (TECs) and nationally protected places.
Australian Marine Spatial Information System (AMSIS)	AMSIS is an interactive web-based tool developed to support the implementation of Marine Bioregional Plans. The Atlas includes data on ecological features, biologically significant areas for protected species, and other marine conservation values. The Atlas has now been superseded by AMSIS, which, in addition to the above, also provides information on maritime boundaries, native title, physical geography and industry uses (shipping, fishing, petroleum and energy resources).
Species Profile and Threats (SPRAT) Database	The database provides information about species and ecological communities listed under the EPBC Act, including population and distribution, habitat, movements, feeding, reproduction and taxonomic comments.
Atlas of Living Australia spatial records tool	The Atlas of Living Australia (ALA) provides a spatial tool for flora and fauna records within the Project Area collated from a variety of sources, including conservation organisations, state departments (Such as DEECA), citizen science groups, and private enterprises.
Australian Wetlands Database	The database provides information on Australia's Ramsar wetlands, and nationally important wetlands listed in the Directory of Important Wetlands of Australia.
Seamap Australia	Seamap Australia is the national repository for the collection of marine habitat datasets. It's maintained in the national interest by the Institute for Marine and Antarctic Studies (IMAS) and the University of Tasmania.
State Databases	
The Victorian Biodiversity Atlas (VBA)	The VBA database GIS mapping and an online data repository of FFG Act listed flora and fauna species recorded within the Project Area.
NatureKit online mapping and data exploration tool	NatureKit maps provides GIS mapping and an online data repository of Victoria's biodiversity values and investment prospects, maintained by the DEECA.
CoastKit online mapping and data exploration tool	CoastKit provides GIS mapping and an online data repository of Victoria's marine and coastal information, maintained by the DEECA. Key data themes include coastal administration, assets, infrastructure,

Data Source	Description
	and marine habitat and biotope data within the Victorian Biotope Atlas.
VicPlan information service and online map viewer	VicPlan provides a mapping tool showing administrative and planning scheme information for Victoria. While primarily relevant to the terrestrial environment, planning scheme information includes planning scheme overlays for significant environment and landscape values in coastal areas.

In addition to the databases summarised in **Table 3-1**, other data and qualitative information has been obtained from the following Australian and state Government departments:

- DCCEEW – Marine bioregional profile for the south-east marine region, Threatened species recovery plans / conservation management plans;
- Commonwealth Scientific and Industrial Research Organisation (CSIRO) – Oceanographic data (e.g., wave data) and Coastal and Marine Resources Information System (CAMRIS) Marine Benthic Substrate Database data;
- Bureau of Meteorology (BOM) – Meteorological data (e.g., wind data);
- Geoscience Australia – GIS data for existing infrastructure and land use;
- Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) – Commercial fishing effort for Commonwealth managed fisheries;
- Victorian Fisheries Authority (VFA) – Commercial fishing effort for state managed fisheries; and
- Agriculture Victoria – Coastal Acid Sulfate Soils distribution.
- Other information presented in this report has been obtained from review of:
 - Aerial imagery of the Project Area (Environmental Systems Research Institute (ESRI) World imagery);
 - Global Wind Atlas;
 - Other projects or environmental studies in the area, including information relating to the Basslink interconnector cable; and
 - Peer-reviewed scientific literature, as referenced within the report.

References cited are included in **Section 8**.

3.2 PRELIMINARY ASSESSMENT

The preliminary impact assessment provided in **Section 5** includes the following steps:

1. Identification of potential impacts and mitigation – Potential impacts associated with the OWF Site and the cable envelopes during all project stages are identified and summarised, and key mitigation included.
2. An assessment of the likelihood of occurrence of listed species identified in the OWF Site and cable envelopes data searches.
3. Preliminary assessment of potentially significant impacts on MNES, consistent with MNES Significant Impact Guidelines 1.1 (Commonwealth of Australia 2013a). MNES considered in this assessment is limited to:

- Ramsar Wetlands
- Commonwealth Marine Area
- Threatened Ecological Communities
- Threatened and Migratory Species
- Commonwealth marine areas.

Heritage matters are considered in the GEOW Preliminary Heritage Constraints Assessment (ERM 2024b); and the Great Barrier Reef, nuclear actions and coal seam gas/large coal mining does not apply to the Project.

4. Self-assessment for referral against the Ministerial guidelines for assessment of environmental effects under the EE Act (Department of Transport and Planning 2023), focused on scope of the Project in state waters, with consideration of potential indirect effects from Project components in Commonwealth waters. All impacts associated with works in Commonwealth waters will be assessed through the EPBC assessment process.

4. DESCRIPTION OF THE EXISTING ENVIRONMENT

This section provides a description of the environment relevant to the OWF Site and cable envelopes.

4.1 REGIONAL SETTING

The OWF Site and cable envelopes are located in the eastern Bass Strait, in waters offshore from the Shire of Wellington in Victoria (**Figure 1-1**), with the OWF Site and Offshore Cable Envelope in Commonwealth waters and the Nearshore Cable Envelope in state waters. The coastal communities of Port Albert, Robertsons Beach, Manns Beach, McLoughlins Beach, Woodside Beach, Giffard and Seaspray are all located inshore to the north of the OWF Site. Wilsons Promontory is located to the west of the OWF Site (**Figure 1-1**).

The Commonwealth waters of the Project Area are within the South-east Marine Region of Australia (Commonwealth of Australia, 2015a). The South-east Marine Region covers approximately 1,632,402 km² and incorporates Commonwealth waters from southern New South Wales, around Tasmania to Kangaroo Island in South Australia. The region is characterised by relatively low nutrient concentrations and low primary productivity, although localised areas of relatively high productivity are associated with the Bonney coast upwelling near the Victoria-South Australia border, the Bass Strait Water Cascade on the shelf break east of Bass Strait and the flow of the East Australian Current along the eastern edge of the region. These areas of productivity, combined with significant variation in water depth and seafloor features, contribute to its recognition as a major marine biogeographic region (Commonwealth of Australia, 2015a).

The socio-economic values of the South-east Marine Region include more than four million people living along the coastline adjacent who rely on the sea, directly or indirectly (Commonwealth of Australia, 2015a). Indigenous occupation of coastal areas dates back at least 40,000 years (Commonwealth of Australia, 2015a). The region supports commercial fishing, aquaculture, recreational fishing, offshore oil and gas production, shipping transport and port activities (Commonwealth of Australia, 2015a). Recently, the region, has become the focus of potential carbon capture and storage and offshore renewable energy proposals.

4.2 PHYSICAL ENVIRONMENT

4.2.1 BATHYMETRY AND SEABED MORPHOLOGY

Water depths across the OWF Site range from approximately -39 m to -69 m below Australian Height Datum (AHD). The shallowest water depths are inshore towards Corner Inlet and are deepest offshore. The majority of the OWF Site is composed of relatively flat sea floor (slope of generally less than 0.25°; Fugro, 2022) and is generally sloping towards deeper water in a south-easterly direction. The sea floor gradient remains relatively consistent throughout the OWF Site and there are no apparent significant bathymetric features.

The Offshore Cable Envelope extends north-west from the northern corner of the OWF Site. The Nearshore Cable Envelope extends north from the Victorian/Commonwealth waters boundary toward the shoreline. The seabed in the cable envelopes rises from approximately -45 m AHD at the OWF Site boundary to -17 m AHD at the state waters boundary to 0 m AHD at the shoreline (**Figure 4-1**).

The DCCEEW geomorphic features dataset (**Figure 4-2**) classifies the majority of the seabed of both the OWF Site and the cable envelopes as 'Shelf'² owing to the continental shelf location, and the absence of any other large-scale geomorphic features. A small section in the eastern extremity of the OWF Site is classified as 'Deep / Hole / Valley'³.

Given the lack of site-specific, high-resolution data, smaller bedforms and other localised seafloor features have not yet been identified in the OWF Site (Fugro, 2022). According to Fugro (2022), bedform features similar to those identified in the Beagle Marine Park (located approximately 12 km south of the OWF Site) may be present, including dune bedforms up to 1 m high, large-scale depressions up to 1 m deep, and low profile crestlines up to 0.5 m high.

The bathymetry and seabed morphology are more complex in coastal waters within the Nearshore Cable Envelope, reflecting the effects of wave action, erosion, current movements of sediments, and the influences of coastal morphology and estuarine/fluviial inputs along the coast.

4.2.2 SEABED GEOLOGY

Due to the lack of site-specific data, seabed conditions across the Project Area have been inferred (Fugro, 2022) using analogous geophysical data from elsewhere in the Bass Strait. The OWF Site is predicted to be on the irregular margin of the Bassian High, a zone of uplifted basement rock that links Tasmania and Victoria (Fugro, 2022). Basement rocks are expected to be relatively shallowly buried or even exposed at the seafloor along the Bassian High, however, it is also possible that basement rocks may be more deeply buried at the margins of the Bassian High (Fugro, 2022). The overlying bedrock is expected to be composed of variably cemented calcarenites, which may be present at the surface (exposed bedrock) or overlain by coarse-grained, calcareous uncemented sand. Based on regional experience, the uncemented sedimentary cover is expected to reach a maximum thickness of up to 10 m (Fugro, 2022).

Sediment grab samples recovered from the surface of the seabed within or near to the OWF Site suggest that coarse sand and coarse shell sand are common in the area and shell fragments and shell gravel are also present (Fugro, 2022). Seabed sediments form the physical components of the benthic habitats and biological communities described in **Section 4.3** below.

4.2.3 COASTAL MORPHOLOGY

The coast adjacent to the OWF Site includes the south-east facing shorelines of the South Gippsland and Wellington Shires with Corner Inlet to the north-west. Based on a review of CoastKit information, the coastline is described as follows.

The coast inshore and to the north of the OWF Site is generally low-lying, predominantly sedimentary islands and sand beaches with sand dune hinterlands. The CoastKit search determined this stretch of coastline as having very high erosion vulnerability. There are several wetlands and river systems that discharge into Bass Strait in the vicinity.

² Zone adjacent to a continent (or around an island) and extending from the low water line to a depth at which there is usually a marked increase of slope towards oceanic depths (Harris et al. 2005).

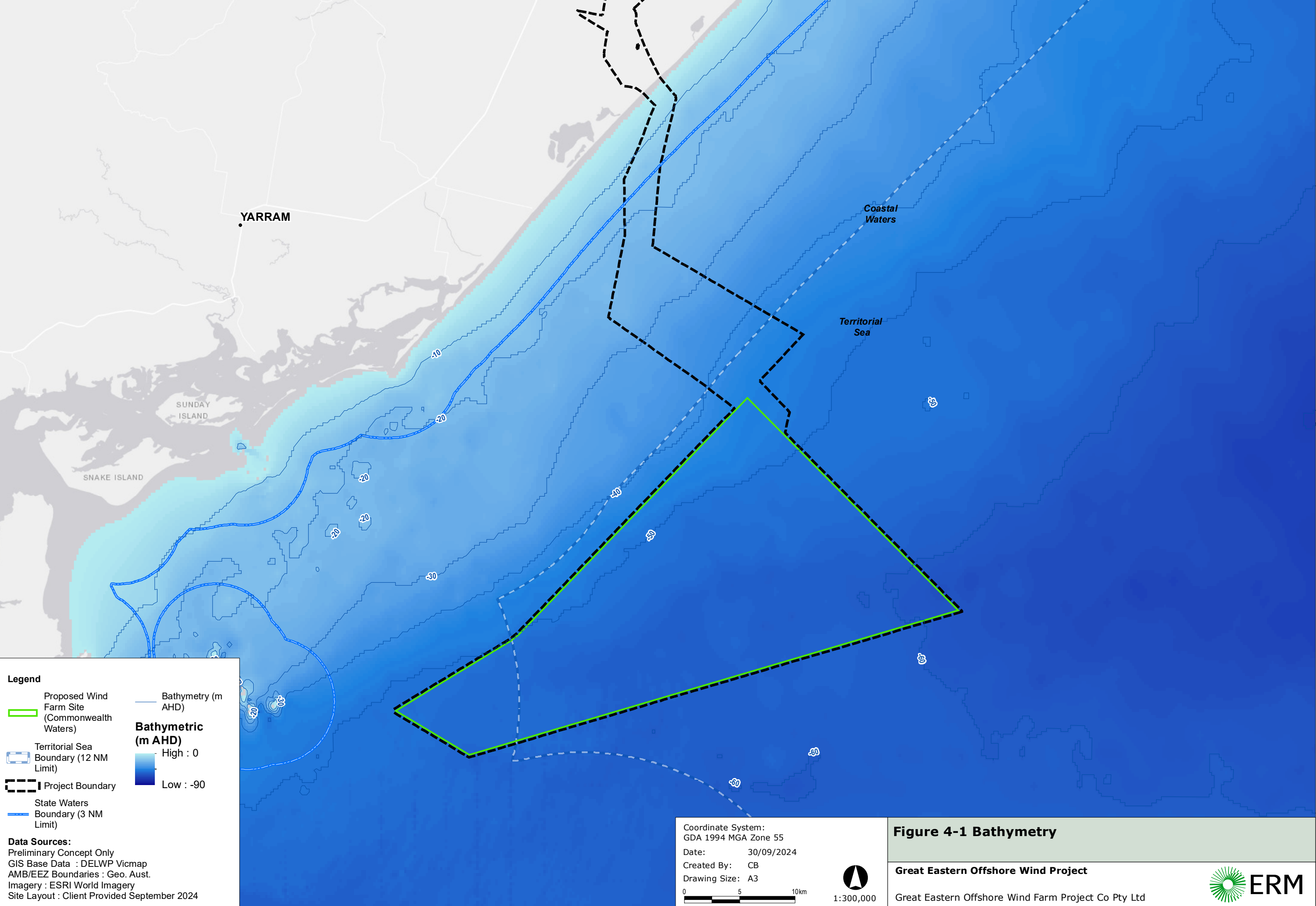
³ Deep: In oceanography, an obsolete term which was generally restricted to depths greater than 6,000 m. Hole: Local depression, often steep sided, of the sea floor. Valley: Relatively shallow, wide depression, the bottom of which usually has a continuous gradient (Harris et al. 2005).

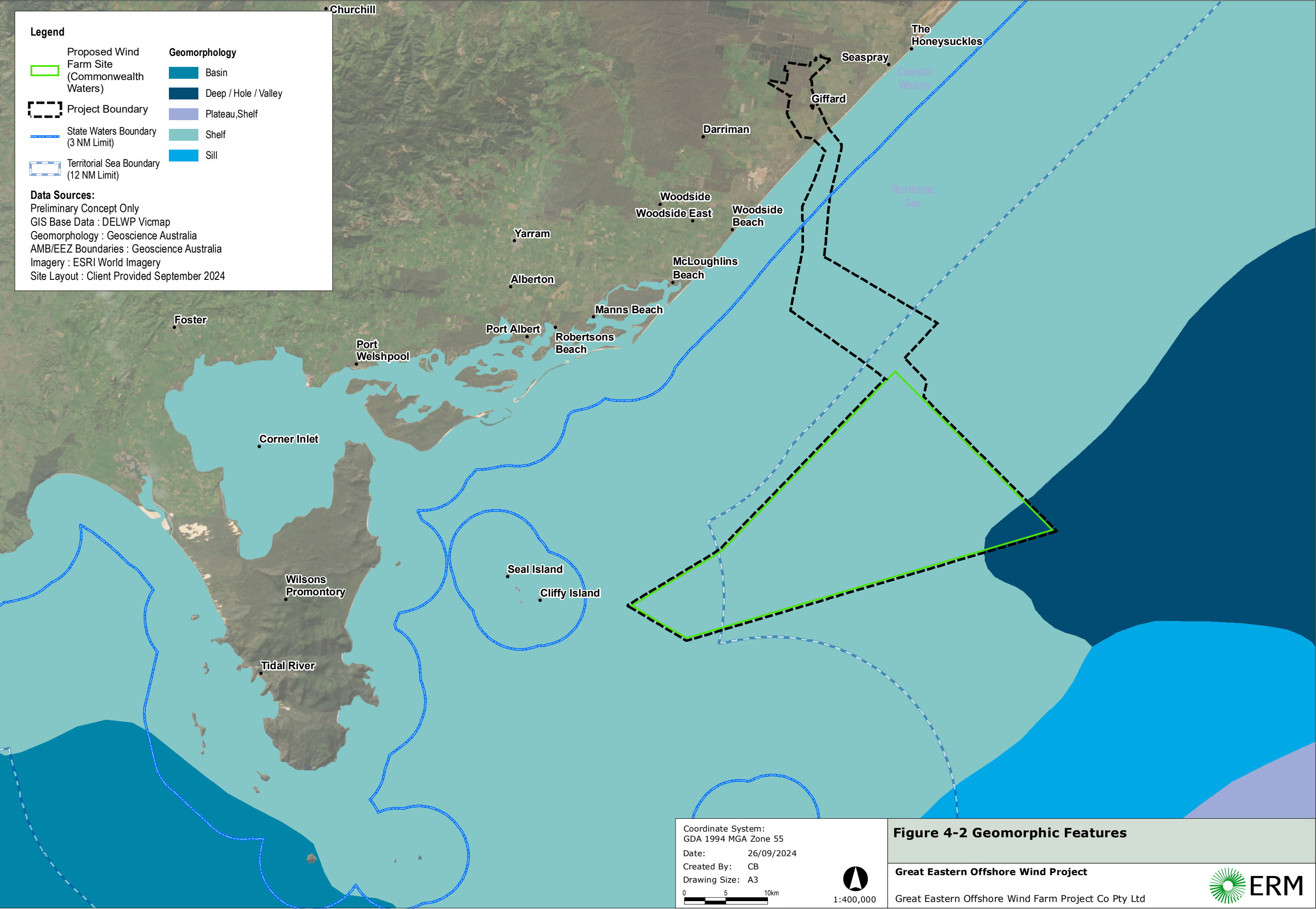
Adjacent to the Nearshore Cable Envelope and inshore of the Offshore Cable Envelope and OWF Site lies Ninety Mile Beach, which extends from Lakes Entrance in the north-east to McLoughlins Beach in the south-west (**Figure 1-1**). Inshore from the beach lies a long and slender vegetated sand dune system, devoid of rocky outcrops or headlands. Dune elevations are typically 5 – 10 m.

The continuity of Ninety Mile Beach includes several river and wetland systems including Morris Creek, Jack Smith Lake and Freshwater Swamp near Woodside Beach, which are all located shoreward of the coastal dunes and more than 5 km south of the Onshore Transmission Envelope.

To the north-west of the OWF Site and west of the cable envelopes lies Corner Inlet, an extensive embayment bounded by the intertidal mudflats and sand islands of Port Albert, and Wilsons Promontory. Corner inlet comprises extensive intertidal mudflats with numerous drainage channels feeding the inlet. The drainage channels are generally shallow but there is deeper navigable water within Franklin channel and Corner Inlet itself.

To the west of the OWF Site lies Wilsons Promontory, which comprises the only rocky promontories in the vicinity of the OWF Site. The complex of rocky headlands that comprises Wilsons Promontory is interspersed with sandy beaches, with the location being exposed to both north-easterly and southerly winds and experiences strong wave action. The mountain peaks of Wilsons Promontory rise to 704 m at Wilsons Range in the south, and 637 m at Vereker Range in the north. Wilsons Promontory provides the coast of Wellington and East Gippsland with significant lee protection from southerly and south-westerly swells, supporting the formation of the Corner Inlet wetlands system.





4.2.4 OCEANOGRAPHY

4.2.4.1 OCEAN CURRENTS

The Bass Strait is situated at the intersection of several major ocean currents, which influence the ecology and hydrology of the region. The Eastern Australian Current (EAC) transports warm equatorial waters southwards down the shelf edge of eastern Australia, including NSW, eastern Victoria and eastern Tasmania. Periodic intrusion of the EAC into the north-eastern Bass Strait are believed to occur, however, this is not well documented (Fugro, 2022).

The western Bass Strait is predominantly defined by the Southern Australian Current (SAC) which transports relatively salty and warm water east along Australia's southern shelf from the Great Australian Bight, before splitting into two directions, with one path continuing into Bass Strait and the other path moves southwards as the Zeehan Current off Tasmania's west coast (Fugro, 2022).

Seasonal currents also occur throughout the Bass Strait, including the Bass Strait Cascade, which occurs in winter when dense water forms in the strait and flows down the eastern continental slope off the coast of East Gippsland to the east of the OWF Site (Fugro, 2022). The Bass Strait Cascade is associated with the upwelling of nutrient-rich waters, which rise to the surface where the eastward flushing of shallow waters mix with cooler, deeper, nutrient rich water (Commonwealth of Australia, 2015a).

4.2.4.2 TIDES

The tides of the central Bass Strait are predominantly semi-diurnal but can vary depending upon location. Tidal streams enter Bass Strait from the east and west almost simultaneously and as a result in the centre of the strait there is an area with small tidal currents where the two tidal influences converge. The magnitude of the tidal streams then increases as the distance from the central strait increases with relatively strong tidal streams at either end. The times and magnitudes of the tide within the Bass Strait are relatively uniform and predictable. However, the effects of meteorological phenomena may be significant, causing variations in level and also changing the phasing or timing of the tide (Sandery and Kampf, 2005).

The OWF Site and cable envelopes are likely to have tidal influences similar to nearby coastal areas. Tide gauges are installed at Lakes Entrance (approximately 110 km north-east of the OWF Site) and Port Welshpool within Corner Inlet (approximately 50 km north-west of the OWF Site).

Port Welshpool pier experiences predominantly semi-diurnal tides with spring tide ranges of between 0.68 m (Mean Low Water Springs; MLWS) and 2.55 m (Mean High Water Springs; MHWS), for a spring tidal range of 1.87 m. Lakes Entrance (Outer) experiences predominantly diurnal tides with spring tide ranges of between -0.32 m (MLWS) and 1.26 m (MHWS), for a spring tidal range of 0.94 m (Victorian Regional Channels Authority 2021).

4.2.4.3 WIND

The Global Wind Atlas indicates that the annual mean wind speed at 150 m altitude (indicative of turbine hub height) across the OWF Site is approximately 9.1 and 9.4 m/s (**Figure 4-3**).

Wind strength and direction data is available from the wind rose for the nearest Bureau of Meteorology (BOM) site at East Sale Airport, approximately 60 km from the OWF Site.

Prevailing wind direction in waters of the OWF Site varies with time of day and season. Winds at East Sale Airport at 0900 Australian Eastern Standard Time (EST; Universal Time Coordinate UTC +10 hours) are generally from the west or northwest year-round. Winds at 1500 EST are generally from the east or south-east during the summer months and from the west during winter (BOM 2019).

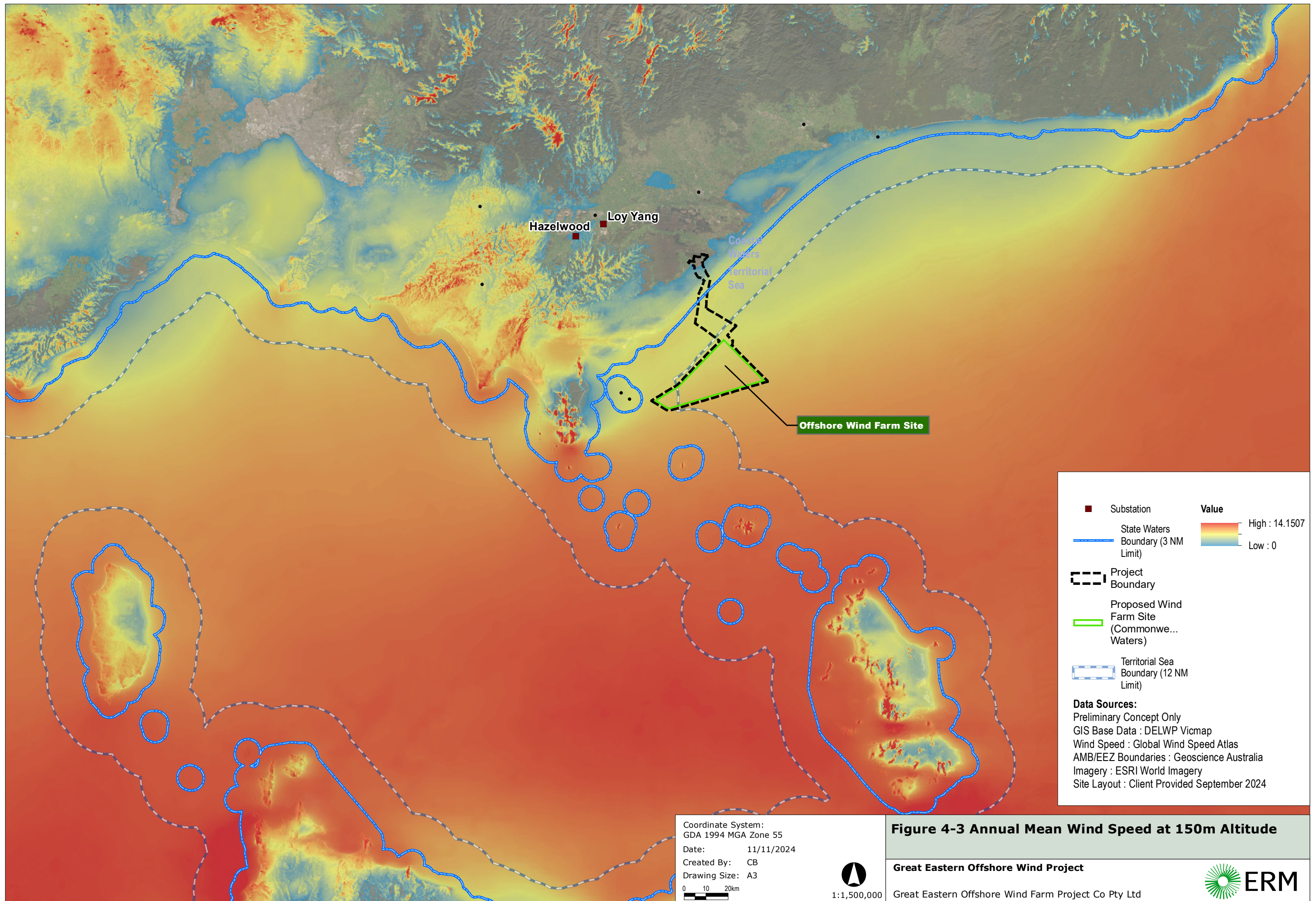
4.2.4.4 WAVES

Wave data⁴ collected from a wave buoy located southeast of Lakes Entrance recorded the following annual average wave conditions over a 12-month period in 1998/99:

- Highest Significant Wave Height: 3.27 m.
- Average Significant Wave Height: 1.0 m.
- Mean peak wave period: 7.3 seconds.

McSweeney (2020) also compared 31 years (1979-2009) of hindcast model wave data for ten locations across Victoria using the National Oceanic and Atmospheric Administration's WaveWatch-III model, including at a location approximately 32 km north-east from the OWF site. The results showed a maximum significant wave height of 4.64 m, mean daily significant wave height of 1.07 m and mean daily primary peak spectral wave period of 7.16 s.

⁴ Wave data was obtained from the Gippsland Lakes Ocean Access Long Term Monitoring and Management Plan Maintenance Dredging with Ocean Placement 2013-2023 (Gippsland Ports, 2013).



4.2.5 COASTAL ACID SULFATE SOILS

Coastal Acid Sulfate Soils (CASS) occur naturally along many parts of Victoria's coastal zone and can potentially extend into intertidal areas, such as the intertidal areas within the Nearshore Cable Envelope. Disturbance or shore crossing. Disturbance of Potential CASS (P-CASS) may result in acidification of water and soil, which can lead to significant impacts to the surrounding ecology, although with best practice and mitigation these impacts are likely to be reduced to an acceptable level.

Spatial data published online by Agriculture Victoria (Rampant et al. 2003) shows areas of potential CASS identified along the boundary of the Nearshore Cable Envelope include wetland areas along the entire coastline inshore of the OWF Site. Key locations of potential CASS include:

- Corner Inlet;
- Port Albert;
- Shoal Inlet;
- Freshwater Swamp;
- Mcloughlins Beach Coastal Reserve; and
- Jack Smith Lake.

Areas of P-CASS may extend to the shoreline and coastal sediments subject to tidal influences. Further investigations will be required at the chosen export cable route to determine the presence of CASS and assess the risk.

4.3 BENTHIC HABITATS AND COMMUNITIES

Data available on benthic habitats and communities in the OWF Site and cable envelopes is currently limited and has provisionally been characterised based on available data from Seamap Australia, and Victorian Biotope Atlas records available through CoastKit. This assessment has been supplemented where relevant with monitoring results from the Basslink project presented in Sherwood et al. (2016).

Seamap Australia is a mapping tool that collates and visualises national benthic habitat mapping data enabling cross-disciplinary studies of continental shelf habitats (Institute for Marine and Antarctic Studies, n.d). Data available for the Project Area via Seamap Australia includes the IMAS national seafloor habitat classification scheme National Benthic Habitat Layer and the CAMRIS Marine Benthic Substrate Database. The limited physical habitat and biological community information in offshore waters reflects the limited number of scientific surveys over the area.

The Victorian Biotope Atlas also provides some records of the benthic habitats and associated biota in the Project Area. Marine and coastal biotopes reported in the Victorian Biotope Atlas are classified using the Combined Biotope Classification Scheme (CbiCS). The biotope classification is based upon a combination of abiotic habitat characteristics (e.g., rock, substrate) and associated biotic components (marine organisms). The records available for the OWF Site and Offshore Cable Envelope are classified to the broad habitat or habitat complex levels, while the composition of biological communities is not sufficiently detailed to be able to assign specific biotopes or sub-biotopes. In the Nearshore Cable Envelope, most records are

also only to the habitat or biotope complex level, although a limited number of records have been classified at the more detailed biotope level.

Benthic habitats within and adjacent to the OWF Site and cable envelopes, based on Seamap Australia are presented in **Figure 4-4**. The known habitats and biotopes recorded in the OWF Site, Offshore Cable Envelope and Nearshore Cable Envelope are summarised in **Table 4-1** and are described below. Generally, the benthic habitats identified in the OWF Site and the cable envelopes in both Commonwealth and state waters indicate predominantly soft (unconsolidated) sediments (gravels, sands, silts) with occasional areas of hard substrate. In the Nearshore Cable Envelope, areas of sponge, algal and seagrass communities have been identified. These are further described in the following subsections.

Sampling conducted for the Basslink project included one site sampled in waters approximately 50 m deep in the OWF Site and two dive sites approximately 1-1.5 km west of the Nearshore Cable Envelope in waters 10 m and 15 m deep respectively (Sherwood et al. 2016). Given the limited available information, Corio proposes to conduct benthic surveys to better understand the benthic habitats and communities within the OWF Site and cable envelopes.

4.3.1 OWF SITE

Based on CAMRIS Marine Benthic Substrate data presented in Seamap Australia (**Figure 4-4**), the majority of the OWF Site is predominantly composed of 'Calcareous gravel, sand and silt'. The shallower areas along the north-eastern boundary of the OWF Site are classed as 'Sand, silt and gravel with less than 50% mud'. The limited Victorian Biotope Atlas records available on CoastKit for the OWF Site include the habitats and habitat complexes 'Sublittoral mixed sediments', 'Sublittoral sand and muddy sand' and 'Sublittoral biogenic reefs', as described in **Table 4-1**. Towed video surveys conducted for the Basslink project in the OWF Site (approximately 10 km west of the centre of the OWF Site) showed the area consisted of shell rubble and grit, broken rock and fine sand with the presence of very small sea urchins and individual sponges (Sherwood et al. 2016). No other biological community data is available for the OWF Site.

4.3.2 OFFSHORE CABLE ENVELOPE (COMMONWEALTH WATERS)

Based on CAMRIS Marine Benthic Substrate data presented in Seamap Australia (**Figure 4-4**), the Offshore Cable Envelope is predominantly composed of 'Sand, silt and gravel with less than 50% mud'. Victorian Biotope Atlas records confirm the presence of 'Sublittoral mixed sediments', 'Sublittoral sand and muddy sand', 'Circalittoral coarse sediment', 'Infralittoral coarse sediment', 'Infralittoral fine sand' and 'Infralittoral rock / other hard substrata', as described in **Table 4-1**. No biological community data is available for the Offshore Cable Envelope.

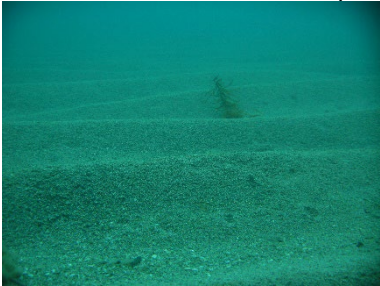
4.3.3 NEARSHORE CABLE ENVELOPE (STATE WATERS)

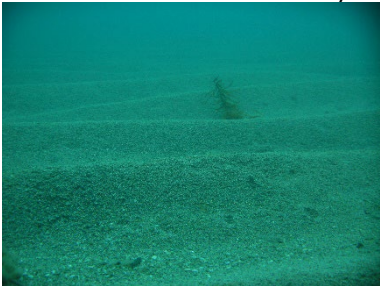


For the Nearshore Cable Envelope, most of this area is classified in Seamap Australia as having no visible biota, although several tracts of seagrass and algae extend from approximately Woodside Beach towards Corner Inlet and Wilson's Promontory (**Figure 4-4**). Dive surveys conducted for the Basslink project at two locations west of the Nearshore Cable Envelope, at distances of 1 km and 5 km offshore, showed medium grain sand at both locations. No sedentary epibiota were visible at the inshore site during two survey events, while the offshore



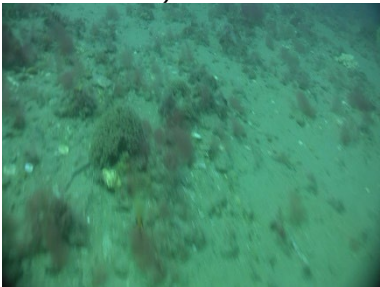

site showed the presence of swimming anemones, soft coral and seastars in very low numbers (Sherwood et al. 2016).


Victorian Biotope Atlas records confirm the presence of a range of habitats and habitat complexes, including 'Sublittoral mixed sediments', 'Sublittoral sand and muddy sand', 'Infralittoral fine sand', 'High energy infralittoral rock', 'Non-reef sediment epibenthos', 'Rippled fine sand' and 'Littoral sand', as described in **Table 4-1**. Nearshore waters in the north-western part of the Nearshore Cable Envelope also include the biotopes, 'Grey mounded colonies with seabed erect sponges (Ninety Mile Beach E)' and 'Thallose Red Algae with Abundant Feather Stars (Ninety Mile Beach A)' (**Table 4-1**).

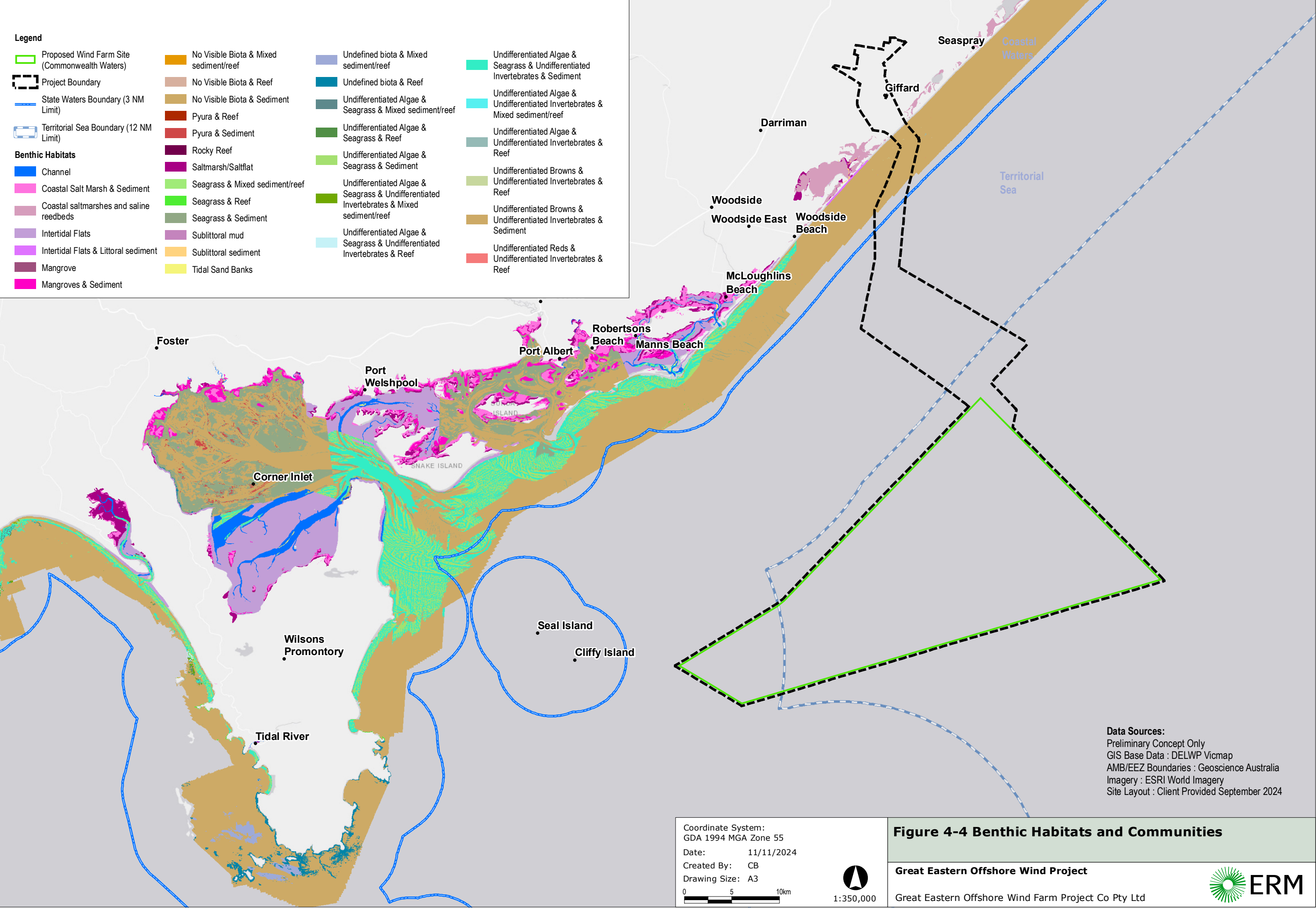
TABLE 4-1 BENTHIC HABITATS AND BIOTOPE RECORDS WITHIN THE OWF SITE AND CABLE ENVELOPES (SOURCE: COASTKIT – VICTORIAN BIOTOPE ATLAS)

Habitat / Biotope [Images are representative examples only and are not specific to the Project Area]	Cw/lt waters	State waters	Description
OWF Site			
Sublittoral sand and muddy sand 	✓		Clean medium to fine sands or non-cohesive slightly muddy sands on open coasts, offshore or in estuaries and marine inlets. Such habitats are often subject to a degree of wave action or tidal currents, which restrict the silt and clay content to less than 15%. This habitat is characterised by a range of taxa including polychaetes, bivalve molluscs and amphipod crustacea.
Sublittoral biogenic reefs No image available	✓		This habitat type includes polychaete reefs, bivalve reefs (e.g., mussel beds) and coldwater coral reefs. These communities develop in a range of habitats from exposed open coasts to estuaries, marine inlets and deeper offshore habitats and may be found in a variety of sediment types and salinity regimes. This habitat complex does not include shallow/mesophotic tropical coral reefs.
Sublittoral mixed sediments No image available	✓		Sublittoral mixed (heterogeneous) sediments found from the extreme low water mark to deep offshore circalittoral habitats. These habitats incorporate a range of sediments including heterogeneous muddy gravelly sands and also mosaics of cobbles and pebbles embedded in or lying upon sand, gravel or mud. These habitats may support a wide range of infauna and epibiota including polychaetes, bivalves, echinoderms, anemones, hydroids and Bryozoa.
Cable Envelopes			
Sublittoral mixed sediments No image available	✓	✓	Sublittoral mixed (heterogeneous) sediments found from the extreme low water mark to deep offshore circalittoral habitats. These

Habitat / Biotope [Images are representative examples only and are not specific to the Project Area]	Cwth waters	State waters	Description
			habitats incorporate a range of sediments including heterogeneous muddy gravelly sands and also mosaics of cobbles and pebbles embedded in or lying upon sand, gravel or mud. These habitats may support a wide range of infauna and epibiota including polychaetes, bivalves, echinoderms, anemones, hydroids and Bryozoa.
Sublittoral sand and muddy sand 	✓	✓	Clean medium to fine sands or non-cohesive slightly muddy sands on open coasts, offshore or in estuaries and marine inlets. Such habitats are often subject to a degree of wave action or tidal currents, which restrict the silt and clay content to less than 15%. This habitat is characterised by a range of taxa including polychaetes, bivalve molluscs and amphipod crustacea.
Circalittoral coarse sediment 	✓		Tide-swept circalittoral coarse sands, gravel and shingle generally in depths of over 15-20 m. This habitat may be found in tidal channels of marine inlets, along exposed coasts and offshore. This habitat, as with shallower coarse sediments, may be characterised by robust infaunal polychaetes, mobile crustacea and bivalves.
Infralittoral coarse sediment No image available	✓		Moderately exposed habitats with coarse sand, gravelly sand, shingle and gravel in the infralittoral, are subject to disturbance by tidal steams and wave action. Such habitats found on the open coast or in tide-swept marine inlets are characterised by a robust fauna of infaunal polychaetes, cumacean crustacea and venerid bivalves.
Infralittoral fine sand 	✓	✓	Clean sands that occur in shallow water, either on the open coast or in tide-swept channels of marine inlets. The habitat typically lacks a significant seaweed component and is characterised by robust fauna, particularly amphipods and robust polychaetes.
Infralittoral rock / other hard substrata	✓		Broad habitat level – No habitat or biotope description available.

Habitat / Biotope [Images are representative examples only and are not specific to the Project Area]	Cwlth waters	State waters	Description
			
High energy infralittoral rock No image available		✓	High energy rock and other hard substrata, including gravel, cobble and boulders.
Non-reef sediment epibenthos No image available		✓	Mixed sublittoral sediments with a substantial cover of epibenthic biota that are not biogenic reef forming, including scallop beds, seapen beds and low densities of <i>Pyura</i> and other ascidians.
Rippled fine sand 		✓	Rippled sand with no obvious microphytobenthos or felting. Echiuran worms may be present. Erect filaments may be present in high abundance. Low abundance of mounded burrows. Minor component of drift algae or Caulerpa trash in ripple troughs.
Grey mounded colonies with seabed erect sponges (Ninety Mile Beach E) 		✓	Grey mounded colonies (possibly <i>Cryptopolyzoon</i> sp.) in moderate abundance on lower infralittoral sand with sparse mounded and seabed erect sponges. Occasional tall branching ascending branching sponges. Thallose red algae tufts present. Short yellow stalked ascidians (possibly <i>Pyura 40ibbose</i>) present in low abundance.
Thallose Red Algae with Abundant Feather Stars (Ninety Mile Beach A) 		✓	Lower infralittoral red algae and <i>Cenolia</i> feather star dominated reef. Tall erect ascending branched sponges present, to moderate high abundance. Seabed erect sponges, yellow mounded pyramid sponges and yellow stalked ascidians (possibly <i>Pyura 40ibbose</i>) present. <i>Cenolia</i> aggregated on rises, ledge edges, crests and reef slopes. Tufts of thallose red algae are abundant. <i>Ecklonia radiata</i> absent or low abundance, apparently dependent on gradients of sand influence. Gradients in sand influence dictate expression of this biotope and the extent of <i>Cenolia</i> abundance, with highest abundance when relief of rock greater than approximately

Habitat / Biotope [Images are representative examples only and are not specific to the Project Area]	Cwlth waters	State waters	Description
			1 m and when reef geomorphological complexity is high. In areas of higher sand influence, lower rugosity and lower relief, red algae dominates and <i>Cenolia</i> is in relatively low abundance.
Littoral sand 		✓	Broad habitat level – No habitat or biotope description available.



4.4 FISH COMMUNITIES

Information on the composition of fish communities that are present in the OWF Site and cable envelopes, as well as any distinction between fish communities that may be found in state waters compared with Commonwealth waters, is currently sparse and based on regional-level descriptions and commercial fisheries information. The Project is located in the Commonwealth's South-east Marine Region, which includes common species such as Tiger Flathead, Bream, Snapper, and Australian Salmon (Commonwealth of Australia, 2015a). The distribution of commercial fisheries that overlap or surround the OWF Site and cable envelopes indicate that the area may also contain Blue Grenadier, Ling, Wrasse, Scallop, Octopus, Australian Sardine, Elephantfish, Boarfish and several shark species (Atlantis 2023).

Fish communities in Beagle MP, 12 km from the OWF Site include species such as Port Jackson Sharks (Parks Australia, 2022), Scorpionfish, Leatherjackets, and Stingarees (Monk et al. 2017). Wilson's Promontory Marine National Park supports populations of recreationally harvested Kingfish, Gummy Shark, Snapper, Whiting and Flathead (FishingMad, 2021), as well as Red Velvetfish, Wrasse, Eastern Blue Groper, and Berber, and is vital to the recovery of White Shark populations (Parks Victoria, n.d.). Threatened and Migratory fish and shark species that may be found in the Project area are outlined in more detail in section 4.6.5.5.

The Project recognises that the data around fish assemblages in the OWF Site and cable envelopes is sparse, and more nuanced information about fish species and community composition in this area would facilitate a robust and transparent environmental assessment. As such, the Project will undertake surveys to characterise fish assemblages in these areas.

4.5 MARINE AND COASTAL PROTECTED AREAS

Australian Marine Parks (AMPs) are marine protected areas located within Australian Commonwealth waters and are managed by the Australian Government. These waters generally extend from 3 nautical miles (nm) off the coast to the outer limit of Australia's Exclusive Economic Zone at 200 nm.

State Marine Protected Areas (i.e., marine reserves and parks) are regions in state waters that are reserved to protect environmental, historical, or cultural features. Marine Protected Areas are managed by Parks Victoria (Parks Victoria, 2022).

The OWF Site and cable envelopes do not overlap any AMPs or state Marine Protected Areas. However, there are several protected areas that are in close proximity to the OWF Site and cable envelope boundaries. These protected areas are identified in **Table 4-2** and presented in **Figure 4-5**, and described in the subsections below.

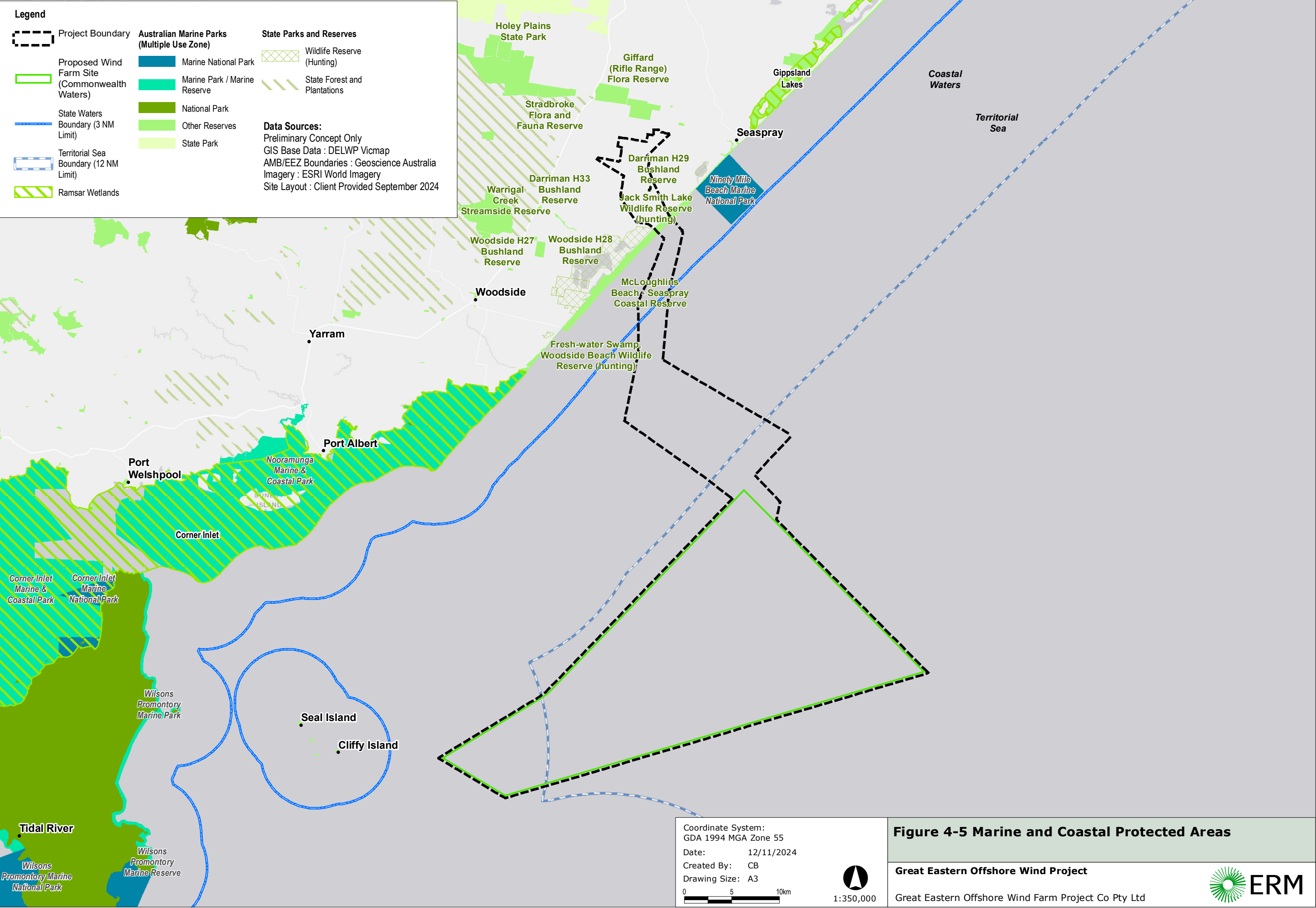
TABLE 4-2 SUMMARY OF MARINE AND COASTAL PROTECTED AREAS IN THE VICINITY OF THE OWF SITE AND CABLE ENVELOPES.

Area type	Protected area	Closest distance to OWF Site	Closest distance to cable envelopes	Jurisdiction	Conservation values of protected area		
					Natural	Cultural	Heritage
Marine	Beagle Marine Park	12 km south	43 km south	Commonwealth	✓	✓	✓
Marine	Wilson's Promontory Marine National Park	35 km south-west	73 km south-west	Victoria	✓	✓	✓
Marine	Wilson's Promontory Marine Park	28 km west	62 km south-west	Victoria	✓	X	X
Marine	Wilson's Promontory Marine Reserve	33 km south-west	71 km south-west	Victoria	✓	X	X
Island	Wilson's Promontory Islands Remote and Natural Area	28 km south-west	62 km south-west	Victoria	✓	✓	X
Mainland	Wilson's Promontory National Park & associated areas ⁵	23 km west	62 km west	Victoria	✓	✓	X
Marine and coastal	Ninety Mile Beach Marine National Park	26 km north	4 km north-east	Victoria	✓	✓	X
Marine and Coastal	Nooramunga Marine and Coastal Park	25 km north-west	11 km west	Victoria	✓	✓	X
Marine and Coastal	Corner Inlet Marine National Park	37 km north-west	56 km west	Victoria	✓	✓	✓
Marine and Coastal	Corner Inlet Marine and Coastal Park	37 km north-west	56 km west	Victoria	✓	✓	✓

⁵ Includes: Southern Wilson's Promontory Remote and Natural Area, Wilson's Promontory Wilderness Zone, Anser Island Reference Area, Mount Vereker Creek Natural Catchment Area, Mount Vereker Creek Reference Area; Entrance Point Reference Area.

Area type	Protected area	Closest distance to OWF Site	Closest distance to cable envelopes	Jurisdiction	Conservation values of protected area		
					Natural	Cultural	Heritage
Mainland and Coastal	Mcloughlins Beach Seaspray Coastal Reserve	29 km North north-west	8 km south-west	Victoria	✓	✓	X
Islands	Seal Islands Wildlife Reserve	14 km west	51 km south-west	Victoria	✓	X	X
Mainland	Jack Smith Lake Wildlife Reserve	23 km north-west	0.2 km north-west ⁶	Victoria	✓	✓	X
Marine	Shallow Inlet Marine and Coastal Park	56 km west (located on the west side of Wilson's Promontory)	79 km west south-west (located on the west side of Wilson's Promontory)	Victoria	✓	X	X

⁶ Based on measurement using the PMST



4.5.1 AUSTRALIAN MARINE PARKS

Whilst no AMPs overlap the OWF Site or cable envelopes, the Beagle Marine Park is located approximately 12 km south of the OWF Site and 43 km south of the Offshore Cable Envelope (**Table 4-2** and **Figure 4-5**). Beagle Marine Park and its conservation values are described in **Section 4.5.1.1** below.

4.5.1.1 BEAGLE MARINE PARK

The Beagle Marine Park northern boundary is located approximately 12 km south of the OWF Site southern boundary (**Figure 4-5**). It is managed by DCCEEW as a Multiple Use Zone and spans 2,928 km² that forms part of the South-East Commonwealth Marine Reserves Network (Director of National Parks (DNP), 2013).

Waters in the park are generally shallow (50 – 70 m) and contain rocky reefs and diverse sponge gardens. The area offers important foraging for seabirds that breed on the nearby islands and is also used by significant gatherings of Port Jackson sharks (NESP, 2017).

Key conservation values of the Beagle Marine Park are listed by DNP (2013) as:

- Ecosystems, habitats and communities associated with the Southeast Shelf Transition and associated with sea-floor features (basin, plateau, shelf, sill);
- Important migration and resting on migration area for Southern Right Whales;
- Important foraging area for Australian Fur Seals, Killer Whales, White Sharks, Shy Albatross, Australasian Gannet, Short-tailed Shearwater, Pacific and Silver Gulls, Crested Tern, Common Diving Petrel, Fairy Prion, Black-faced Cormorant and Little Penguin; and
- Cultural and heritage sites (the wrecks of the steamship SS Cambridge and the ketch Eliza Davies).

4.5.2 STATE MARINE AND COASTAL PROTECTED AREAS

No state marine or coastal parks overlap the OWF Site or Nearshore Cable Envelope. There are 13 state parks in the vicinity (**Table 4-2**, **Figure 4-5**), the closest being the Jack Smith

Lake Wildlife Reserve, which lies 20 m inland from the Nearshore Cable Envelope at the shoreline boundary and Ninety Mile Beach Marine National Park, located approximately 4 km to the north-east of the Nearshore Cable Envelope at the shoreline boundary..

4.5.2.1 WILSON'S PROMONTORY MARINE NATIONAL PARK, MARINE PARK AND MARINE RESERVE

Wilsons Promontory Marine National Park is located at the southern tip of the Australian mainland, approximately 33 km south-west of the OWF Site (**Figure 4-5**). Wilsons Promontory Marine National Park is assigned the International Union for the Conservation of Nature and Natural Resources (IUCN) Category II of the United Nation's List of National Parks and Protected Areas (managed primarily for ecosystem protection and recreation) (Parks Victoria, 2006b). It is part of a larger 'planning area', which also contains Wilsons Promontory Marine Park (33 km west of the OWF Site), Wilsons Promontory Marine Reserve (33 km south-west of the OWF Site) and the Wilsons Promontory Islands Remote and Natural Area (28 km south-west of the OWF Site) (**Figure 4-5**). The planning area surrounds the offshore islands of Wilsons Promontory. These islands are relatively remote from vehicular access and from boat

ramp access points. Twelve of the islands are designated as the 'Wilsons Promontory Islands Remote and Natural Area' to protect their remote and natural attributes.

Important values of the planning area (Parks Victoria, 2006b) include the following:

Natural values:

- Granite habitats, which are unusual in state marine waters, including extensive heavy reefs with smooth surfaces, boulders and rubble and low-profile reefs;
- Biological communities with distinct biogeographic patterns, including shallow subtidal reefs, deep subtidal reefs, intertidal rocky shores, sandy beaches, seagrass and subtidal soft substrates;
- Abundant and diverse marine flora and fauna, including fish species and invertebrates such as sponges, ascidians, sea whips and bryozoans;
- 68 species of marine flora and fauna recorded, or presumed to be, at their eastern or western distributional limits;
- Kanowna Island, an important breeding site for a significant colony of over 9,000 Australian Fur Seals;
- Vital to the recovery of White Shark populations;
- Important habitat for several Threatened shorebird species, including species listed under international migratory bird agreements; and
- Outstanding landscapes, seascapes and underwater scenery.

Cultural values⁷:

- Part of the sacred Country of Yiruk for the Gunaikurnai people and Wamoom for the Boonwurrung people;
- Seascape of high traditional and cultural significance to First Nations people;
- Cultural places and objects of significance to First Nations people;
- Part of a past land link to Tasmania occupied and used by First Nations people;
- Indigenous cultural lore and interest maintained by the Gunaikurnai people and Boonwurrung people;
- Important maritime and other history; and
- Historic shipwrecks, many of which are listed on the Victorian Heritage Register.

Recreational and tourism values:

- Opportunities for diving and snorkelling;
- Landscapes and intertidal areas for exploring;
- Opportunities for passive recreation, relaxation and reflection on a wild and remote coastline; and
- Boat-based camping in a remote and unique setting

⁷ Refer to the Great Eastern Offshore Wind: Heritage Constraints Assessment (ERM, 2024b) for assessment of identified cultural values within the Project Area and buffer.

4.5.2.2 WILSON'S PROMONTORY NATIONAL PARK AND ASSOCIATED AREAS

Wilsons Promontory National Park (34 km west of the OWF Site) (**Figure 4-5**) is the oldest existing National Park in Victoria, being permanently reserved since 1905 (Parks Victoria, 2002).

The Park is assigned the International Union for the Conservation of Nature (IUCN) Category II (National Parks) of the United Nations' List of National Parks and Protected Areas (managed primarily for ecosystem conservation and appropriate recreation). The Park has outstanding natural values. It has diverse vegetation communities, including warm temperate and cool temperate rainforest, tall open forests, woodlands, heathlands, and swamp and coastal communities. The National Park also provides habitat for several Threatened fauna species, including the New Holland Mouse, Long-nosed Potoroo, Ground Parrot, White-bellied Sea-Eagle, Swamp Skink, and the Damselfly *Hemiphysalis mirabilis*, and several biogeographically significant species, including a number of plant species and communities which have associations with other parts of Australia or are Threatened or at the limits of their distribution (Parks Victoria, 2002).

Wilsons Promontory National Park, Wilsons Promontory Lightstation, Citadel Island, two indigenous places (at Tidal River and Yanakie) and three shipwrecks are listed on the Register of the National Estate in recognition of these features' outstanding values and their importance as a part of our heritage (Parks Victoria, 2002).

4.5.2.3 NINETY MILE BEACH MARINE NATIONAL PARK

Ninety Mile Beach Marine National Park is located approximately 28 km north of the OWF Site and 4.2 km north-east of the Nearshore Cable Envelope (**Figure 4-5**). The park forms a square and extends along the coastline and offshore for approximately five kilometres (3 nm) (Parks Victoria, 2006a).

Ninety Mile Beach Marine National Park is assigned the International Union for the Conservation of Nature and Natural Resources (IUCN) Category II (managed primarily for ecosystem protection and recreation) and protects an example of an internationally significant sandy environment, recognised for its exceptionally high diversity of marine invertebrates. Low calcarenite reefs offshore are habitat to a unique invertebrate biota, including colourful sponge gardens. The long sandy beach provides extensive habitat for shorebirds, including international Migratory waders and the Threatened Hooded Plover (Parks Victoria, 2006a).

4.5.2.4 NOORAMUNGA MARINE AND COASTAL PARK

The Nooramunga Marine and Coastal Park is located 25 km north-west of the OWF Site and approximately 12 km north-west of the Nearshore Cable Envelope at the nearest point (**Figure 4-5**). The park consists of shallow marine waters, isolated granite islands, intertidal mudflats and a complex of over 40 sand barrier islands (Department of Natural Resources and Environment, 1996). These islands provide sheltered waters for anglers, who target snapper, King George whiting, flathead, garfish and Australian Salmon. The Park also contains a camping area and jetty that facilitates recreational activities.

4.5.2.5 CORNER INLET MARINE NATIONAL PARK / MARINE AND COASTAL PARK

Corner Inlet Marine National Park is situated 39 km north-west of the OWF Site, adjacent to Wilsons Promontory National Park and integrally linked to Corner Inlet Marine and Coastal Park

(**Figure 4-5**). The park forms part of an area that has been recognised as a wetland of international significance under Article 2 of the Ramsar Convention (see **Section 4.5.3**). The strategic management plan for Corner Inlet Ramsar site was published in May 2002 (NRE 2002).

The National Park is assigned the International Union for the Conservation of Nature and Natural Resources (IUCN) Category II of the United Nations' List of National Parks and Protected Areas (managed primarily for ecosystem protection and recreation). Corner Inlet Marine National Park contains a representative area of the only extensive Broad-leaf Seagrass meadows in Victoria. This seagrass community supports the most diverse fauna of all marine habitats in the Corner Inlet and Nooramunga area (ECC 2000). The National Park also includes many other open bay habitat types, such as mangrove, intertidal sandy beaches and subtidal soft sediments, having very high diversity of invertebrates in soft sediments and important habitat for Threatened shorebird species, including species listed under international migratory bird agreements (Parks Victoria, 2005).

4.5.2.6 MCLOUGHLINS BEACH SEASPRAY COASTAL RESERVE

Mcloughlins Beach Seaspray Coastal Reserve is located approximately 26 km north north-west of the OWF Site and 8 km south-west from the Nearshore Cable Envelope at the shoreline boundary (**Figure 4-5**). A desktop search could not locate any specific information about the environmental values of this reserve.

4.5.2.7 SEAL ISLANDS WILDLIFE RESERVE

This collection of islands is located 13 km from the OWF Site and 50 km south-west of the Nearshore Cable Envelope and includes Seal, Notch and Rag Islands (**Figure 4-5**). A desktop search could not locate any specific information about the environmental, cultural or heritage values of this reserve.

4.5.2.8 JACK SMITH LAKE WILDLIFE RESERVE

This reserve is encompassed by a wetland of National Significance and is discussed further in **Section 4.5.3**.

4.5.2.9 SHALLOW INLET MARINE AND COASTAL PARK

This Park is located approximately 56 km from the OWF Site and 84 km from the Nearshore Cable Envelope to the west of Wilson's Promontory (**Figure 4-5**). In addition to being a park, the site is a wetland of national significance; the area is discussed in more detail in **Section 4.5.3**.

4.5.3 IMPORTANT WETLANDS

Australia is signatory to The Convention on Wetlands of International Importance (the Ramsar Convention), which aims to halt the worldwide loss of wetlands and to conserve those that remain. As a member country, Australia nominates to places wetlands on the List of Wetlands of International Importance (Ramsar wetlands) if those sites are representative, rare or unique, or are important for conserving biological diversity. Australia currently has 65 listed Ramsar sites, 12 of which are in Victoria. Ramsar sites are protected under the EPBC Act.

Wetlands in Australia that are listed under the Ramsar Convention, in combination with other international agreements such as the Japan-Australia Migratory Bird Agreement (JAMBA), the China-Australia Migratory Bird Agreement (CAMBA), the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), and the East Asian-Australasian Flyway Partnership, provides protection to Migratory bird species and their habitats.

As a key part of their commitment to recognising Australia's most important wetlands, all state, territory and commonwealth governments have jointly compiled a list of nationally important wetlands. Among the criteria required to be listed as nationally important, a wetland must support at least one per cent of the national populations of any native plant or animal species. Australia currently has 904 wetlands of national importance; according to DCCEEW's Directory of Important Wetlands, 159 of these wetlands are located in Victoria.

The PMST tool identified that there are no protected wetlands overlapping the OWF Site or cable envelopes. However, there are two Ramsar sites located in the region (Corner Inlet Ramsar site and Gippsland Lakes Ramsar site), and three nationally important wetlands to the north-east of the Nearshore Cable Envelope (Lake Wellington, Lake Victoria and Lake King) (**Figure 4-5, Table 4-3**). According to the DCCEEW's Database of Important Wetlands those three wetlands form part of the Gippsland Lakes Ramsar site.

With this overlap considered, there are four agglomerations of protected wetlands in the vicinity of the Project:

- Corner Inlet Ramsar site;
- Jack Smith Lake State Game Reserve;
- Gippsland Lakes Ramsar site (incorporating Lake Wellington, Lake Victoria and Lake King wetlands); and
- Shallow Inlet Marine and Coastal Park nationally important wetland.

Descriptions of these wetland agglomerations are provided in the following subsections.

Although the wetlands do not occur within the OWF Site or cable envelopes, they are described in this report given that they are subject to coastal intertidal influences, support Migratory shorebirds and given their proximity to the Project. The potential for indirect impacts to these sites is considered in **Section 5**.

TABLE 4-3 SUMMARY OF PROTECTED WETLANDS IN THE VICINITY OF THE OWF SITE AND CABLE ENVELOPES.

Wetland type		Wetland name	Closest distance to OWF Site	Closest distance to cable envelopes
Ramsar site	Nationally Important Wetland			
✓	✓	Corner Inlet	26 km north-west	11 km north-west
✓	X	Gippsland Lakes	37 km north-east	13 km north-east
X	✓	Shallow Inlet Marine and Coastal Park	56 km west	79 km west-southwest

Wetland type		Wetland name	Closest distance to OWF Site	Closest distance to cable envelopes
Ramsar site	Nationally Important Wetland			
X	✓	Jack Smith Lake State Game Reserve	25 km north-west	0.02 km north of Nearshore Cable Envelope (Onshore Transmission Envelope intersects northern tip of listed wetland area)
X	✓	Lake Wellington Wetlands (part of Gippsland Lakes Ramsar site)	58 km north-east	44 km north-east of OCE 36 km north-east of NCE
X	✓	Lake Victoria Wetlands (part of Gippsland Lakes Ramsar site)	70 km north-east	48 km north-east
X	✓	Lake King Wetlands (part of Gippsland Lakes Ramsar site)	96 km north-east	73 km north-east

4.5.3.1 CORNER INLET RAMSAR SITE

The Corner Inlet Ramsar site is approximately 26 km from the OWF Site, 11 km north-west of the Offshore Cable Envelope and 20 km south-west of the Nearshore Cable Envelope (**Figure 4-5**). The Corner Inlet Ramsar site covers 67,192 hectares (ha) of the most southerly marine embayment and tidal mudflat system of mainland Australia (NRE 2002).

Within the Corner Inlet Ramsar site the four wetland types recognised under the classification system used by the Ramsar Convention are: permanent shallow marine water, intertidal mud, sand or silt flat, intertidal marshes and intertidal forested wetlands. More than 290 species of native flora and 160 species of native fauna have been recorded at this Ramsar site, comprising coastal and terrestrial species. Of these, one flora and six fauna species are listed as threatened under the EPBC Act, nine fauna species are listed under the FFG Act, 24 bird species are listed under the JAMBA, 26 species are listed under the CAMBA, and 27 species are listed under the ROKAMBA.

The Corner Inlet Ramsar Site contains 15 vegetation communities, with significant areas of saltmarsh, mangroves and seagrass beds (NRE 2002). The Corner Inlet Ramsar site provides internationally important feeding, resting and breeding habitat for 57 waterbirds including a range of waders; Pied Oystercatchers, Sooty Oystercatcher, Eastern Curlew, Bar-tailed Godwit, Red Knot, Grey Plover, Double-banded Plover, Curlew Sandpiper, Red-necked Stint, Sanderling, Pacific Golden Plover, Greenshank and Ruddy Turnstone (Watkins 1993).

The Southern Right Whale is a winter visitor to the site as part of its seasonal migration to southern Australia. Other common visitors include Australian Fur Seal and Bottlenose Dolphin and records exist of the Long-nosed Fur Seal and Leopard Seals (NRE 2002). Key characteristics of the Ramsar site are summarised in **Table 4-4**.

TABLE 4-4 SUMMARY OF CRITICAL COMPONENTS AND PROCESSES FOR THE CORNER INLET RAMSAR SITE⁸

Element	Summary description
Wetland bathymetry	540 km ² of the total 630 km ² area of the site is water or intertidal flats with the remainder comprising island and fringing wetlands.
Geomorphology	Important geomorphological features that control habitat extent and types include: <ul style="list-style-type: none"> • sand barrier island and associated tidal delta system; • the extensive tidal channel network; and • mudflats and sandflats.
Flora – seagrass	14 800 ha of various seagrass species in 2011.
Flora – mangrove and intertidal saltmarsh	6500 ha of intertidal saltmarsh vegetation in 2011 – northern mainland shore and on most islands (including Franklin and Snake Island). 2137 ha of mangrove vegetation in 2011 – dense coverage along the northern shoreline. Scattered vegetation along the southern shoreline.
Flora – significant species	The site supports a number of species of state conservation significance considered critical in maintaining its character. White Mangrove (<i>Avicennia marina</i> subsp. <i>australasica</i>) are listed as rare within Victoria and are characteristic of the mangrove fringe within the site. No wetland-dependent conservation significant species have been recorded due to a lack of survey effort.
Fauna – waterbirds	A total of 95 waterbird species have been recorded within the site which represents 93 per cent of the waterbird diversity recorded in Victoria. The site's waterbird assemblage includes 24 Migratory shorebird species, 13 resident shorebird species and 14 species of gulls and terns. Mean annual abundance of Migratory species has been recorded as 31 487 birds, with a maximum of 42 811 birds (1980-2008). The Ramsar site regularly supports more than 1 per cent of the estimated populations of seven waterbird species. The site also supports the following numbers of non-pelagic waterbird species protected by bilateral agreements: 26 species listed under CAMBA, 24 species listed under JAMBA and 27 species listed under ROKAMBA.
Fauna – marine invertebrates	Over 390 invertebrate species have been recorded at the site, three of which appear restricted to Corner Inlet.
Fauna – fish	Diverse assemblages of fish species, including a number of commercially significant species, characteristic of various marine habitats. The site supports outstanding fish habitat values that contribute to the health and sustainability of the bioregion.
Fauna – significant species	The site supports nationally Threatened fauna species including: <ul style="list-style-type: none"> • Orange-bellied Parrot (<i>Neophema chrysogaster</i>) (EPBC Act Critically Endangered, IUCN Red List Endangered); • Growling Grass Frog (<i>Litoria raniformis</i>) (EPBC Act Vulnerable, IUCN red List Endangered); • Fairy Tern (<i>Sterna nereis nereis</i>) (IUCN Red list Vulnerable); and • Australian Grayling (<i>Prototroctes maraena</i>) (EPBC Act Near Threatened, IUCN Red List Threatened).

⁸ Source: Corner Inlet Ramsar Wetland Ecological Character Description, which was published in 2011 as part of the listing of this site under the Ramsar convention (DSEWPAC, 2011a).

4.5.3.2 JACK SMITH LAKE STATE GAME RESERVE

According to the DCCEEW Directory, the Jack Smith Lake State Game Reserve is part of the Corner Inlet wetlands aggregation. The Reserve lies 20 m inshore from the Nearshore Cable Envelope (**Figure 4-5**) and intersects the Onshore Transmission Envelope. The Reserve's 13 km-long south-eastern boundary lies on the shoreward side of the Ninety Mile Beach Coastal Reserve.

This Reserve includes Jack Smith and Lambs Lake (a smaller wetland of 85 ha) and small herb fields interspersed between thickets of Swamp Paperbark (*Melaleuca ericifolia*) and subject to regular wetting and drying cycles (Commonwealth of Australia, 2023a). Jack Smith Lake is intermittent; water levels may be high in some years and very low in others.

The Reserve features extensive coastal lagoons, salt marshes and native grasslands, and is used by 117 bird species including 45 waterbird species (Commonwealth of Australia, 2023a). Notably, the area is a breeding site for the Threatened Hooded Plover (*Thinornis rubricollis*), and is one of only seven state breeding colonies for the Australian Pelican, (*Pelecanus conspicillatus*). The FFG-listed Orange-bellied Parrot (*Neophema chrysogaster*) has also been recorded in the area.

The DCCEEW Directory lists duck hunting, camping and fishing as the major recreational activities in the Reserve.

4.5.3.3 GIPPSLAND LAKES RAMSAR SITE

The Gippsland Lakes Ramsar Site is located 37 km north-east from the OWF Site and 13 km north-east from the Nearshore Cable Envelope (**Figure 4-5**). The Gippsland Lakes is the largest estuarine lagoon system in Australia. The site consists of a system of thirteen lakes and swamplands, which are separated from the sea at Ninety Mile Beach by a barrier system of sand dunes. It was listed as a Ramsar site under the Ramsar Convention in 1982 in recognition of its outstanding coastal wetland values and features. In 2010, the site met six of the nine criteria for listing and a wetland of international importance (East Gippsland Catchment Management Authority, 2015).

The Gippsland Lakes supports the following coastal-intertidal and terrestrial species listed under the EPBC Act and/or IUCN Red List: Fairy tern (*Sternula nereis nereis*), Green and Golden Bell Frog (*Litoria aurea*), Growling Grass Frog (*Litoria raniformis*), Australian Grayling (*Prototroctes maraena*), Australasian Bittern (*Botaurus poiciloptilus*), Dwarf Kerrawang (*Commersonia prostrata*), Swamp Everlasting (*Xerochrysum palustre*) Metallic Sun-orchid (*Thelymitra epipactoides*). Coastal saltmarsh is now listed as Vulnerable under the EPBC Act, and the site supports substantial areas of this ecological community. The site "regularly" supports (i.e., in three out of five years) more than 20,000 waterbirds. In 2011 a new species of dolphin, the Burrnun Dolphin (*Tursiops australis*), was described from south-eastern Australia and the Gippsland Lakes is one of only two known resident populations of this species (East Gippsland Catchment Management Authority, 2015). Key characteristics of the site are summarised in **Table 4-5**.

According to DCCEEW's Directory of Important Wetlands, the Gippsland Lakes Ramsar site also encompasses the Lake Wellington wetlands, Lake Victoria wetlands and Lake King wetlands.

TABLE 4-5 SUMMARY OF CRITICAL COMPONENTS AND PROCESSES FOR THE GIPPSLAND LAKES RAMSAR SITE⁹

Element	Summary description
Wetland bathymetry	The bathymetry of Gippsland Lakes is highly varied and includes shallow mudflats and sand banks that can be exposed as water levels in the lakes drop due to ocean mean sea level influences. The deepest areas, down to 10 – 12 m deep, occur in Lake Victoria, Lake King (south of the Silt Jetties), and in Reeve Channel.
Geomorphology	Important geomorphological features that control habitat extent and types include: <ul style="list-style-type: none"> • Bathymetry; and • Sediment transport.
Flora - seagrass	5013 ha of seagrass beds that are widely distributed within the site (particularly in the east). Species of seagrass that are present include <i>Zostera muelleri</i> , <i>Heterozostera tasmanica</i> , <i>Ruppia spiralis</i> and <i>Lepilaena cylindrocarpa</i> .
Flora – mangrove and intertidal saltmarsh	Approximately 7137 ha of intertidal marshes are present within the Ramsar site. Representative examples of saltmarsh communities are located at Blond Bay, Lake Reeve, Point Fullarton and Eagle Point Bay. Characteristic saltmarsh species present include Beaded Glasswort (<i>Sarcocornia quinqueflora</i>) and Sea Rush (<i>Juncus kraussii</i>).
Flora – significant species	Three nationally Vulnerable and Endangered wetland-associated flora species have been recorded as within the site: <ul style="list-style-type: none"> • Dwarf Kewong (<i>Rulingia prostrata</i>); • Swamp Everlasting (<i>Xerochrysum palustre</i>); and • Metallic Sun-orchid (<i>Thelymitra epipactoides</i>).
Fauna – waterbirds	Gippsland Lakes provide important feeding, resting and breeding habitat for 86 waterbird species which represents approximately 93 per cent of the waterbird diversity recorded in Victoria. Many are listed under JAMBA, CAMBA, ROKAMBA and/or the CMS. Gippsland Lakes and associated swamps and morasses regularly support approximately 40,000 to 50,000 waterbirds. The Ramsar site regularly supports more than 1 per cent of the estimated populations of two waterbird species: <ul style="list-style-type: none"> • Red-necked Stint (<i>Calidris ruficollis</i>); and • Sharp-tailed Sandpiper (<i>Calidris acuminata</i>).
Fauna – marine invertebrates	The aquatic invertebrate fauna of the Gippsland Lakes have been little studied.
Fauna – fish	The fish community within the Gippsland Lakes Ramsar site is diverse, with approximately 179 species inhabiting all of the Lakes' wetland types (except for the most hypersaline wetlands), including several key fish species of commercial significance.
Fauna—significant species	Threatened frog species that have been recorded regularly within the site with known and potentially suitable habitat include: <ul style="list-style-type: none"> • Green and Golden Bell Frog; and • Growling Grass Frog.

⁹ Source: Gippsland Lakes Ramsar Wetland Ecological Character Description, which was published in 2010 as part of the listing of this site under the Ramsar convention (DESPAC, 2011b).

LAKE WELLINGTON, LAKE VICTORIA AND LAKE KING WETLANDS

According to DCCEEW's Directory of Important Wetlands, Lake Wellington wetlands, Lake Victoria wetlands and Lake King wetlands are part of the Gippsland Lakes Ramsar site.

Lake Wellington wetlands is a wetland of national importance and is located within the Gippsland Lakes Ramsar site (Parks Victoria, 2008). Lake Wellington Wetlands spans 9,000 ha and is approximately 58 km and 34 km from the OWF Site and Nearshore Cable Envelope, respectively. The site comprises 20 areas of Crown land with similar management objectives.

These wetlands are of high value as they act as drought refuges for fauna. At Lake Wellington, over 185 bird species, including 87 waders and water birds have been recorded (Parks Victoria, 2008). Of these, 27 species are listed under the Japan-Australia Migratory Birds Agreement 1974, the China-Australia Migratory Birds Agreement 1987, and the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn convention).

The fringing wetlands around Lake Wellington are an important filtering system and nursery ground for the lakes' food chain, and they provide essential habitat for the Nationally Endangered Growling Grass (*Litoria raniformis*), and Green (*L. caerulea*) and Golden Bell (*L. aurea*) frogs. The area is also used by the Australasian Bittern (*B. poiciloptilus*), and migratory wading birds such as the Sharp-tailed Sandpiper (*C. acuminata*) and Latham's Snipe (*Gallinago hardwickii*) (Greening Australia, 2016).

Lake Victoria wetlands is a wetland of national importance and is located within the Gippsland Lakes Ramsar site (Commonwealth of Australia, 2023b). Lake Victoria Wetlands is 10850 ha and is approximately 70 km and 48 km from the OWF Site and Nearshore Cable Envelope, respectively.

Lake Victoria is a large coastal lagoon with fringing saltmarsh. Lake Victoria comprises wetlands highly valued for their ecological, recreational, tourist, scientific, educational, cultural and landscape features and are known to support a highly productive fish community (Commonwealth of Australia, 2023b).

Forty-four waterbird species have been recorded in these wetlands. Lake Victoria and Blond Bay support the following Threatened species:

- Little Tern (*Sterna albifrons*);
- Fairy Tern (*S. nereis*);
- Freckled Duck (*Stictonetta naevosa*);
- Eastern Curlew (*Numenius madagascariensis*);
- White-bellied Sea-eagle (*Haliaeetus leucogaster*); and
- Ground Parrot (*Pezoporus wallicus*).

Lake King wetlands is a wetland of national importance and is located within the Gippsland Lakes Ramsar site (Commonwealth of Australia, 2023c). Lake Victoria Wetlands is 7100 ha and is approximately 96 km and 73 km from the OWF Site and Nearshore Cable Envelope, respectively.

The Lake King wetlands consist of two large coastal lagoons and associated channels with surrounding salt marshes and brackish to fresh marshes (Commonwealth of Australia, 2023c).

These wetlands are of high value for fauna and part of a major drought refuge. Forty-six waterbird species have been recorded in Lake King. These wetlands are known to support the following threatened species; the Little Tern (*S. albifrons*), the Fairy Tern (*S. nereis*), Eastern Curlew (*N. madagascariensis*) and the White-bellied Sea-eagles (*H.leucogaster*).

4.5.3.4 SHALLOW INLET MARINE AND COASTAL PARK

Shallow Inlet is located on Victoria's south-east coastline at Waratah Bay, which lies north-west of Wilson's Promontory, near the small town of Sandy Point. The Park is approximately 56 km from the OWF Site and 79 km west-southwest from the Offshore Cable Envelope (**Figure 4-5**). In addition to being a marine and coastal park (see **Section 4.5.2.9**), the site is a wetland of national significance.

Shallow Inlet Marine and Coastal Park consists of 2,300 ha of wave-dominated estuary, in mostly unmodified condition (Collins, 2004). According to DCCEE's Directory of Important Wetlands, this wetland contains 13 sites of state, regional and local geological and geomorphological significance.

The site contains six types of wetland:

- Permanent shallow marine waters less than six metres deep at low tide, including sea bays and straits;
- Marine subtidal aquatic beds, including kelp beds, sea-grass beds, tropical marine meadows;
- Sand, shingle or pebble shores, including sand bars, spits and sandy islets; includes dune systems;
- Intertidal mud, sand or salt flats;
- Intertidal marshes, including salt marshes; and
- Coastal brackish/saline lagoon.

About 180 bird species have been recorded at Shallow Inlet; 19 of these species are listed under the Japan-Australia Migratory Birds Agreement, and 16 species are listed under the China-Australia Migratory Birds Agreement. The site regularly supports over 1% of flyway population of five species of migratory shorebird: the curlew sandpiper, double-banded plover, eastern curlew, red-necked stint, and sanderling (Collins, 2004). The site is:

- Nationally significant for the Pacific Golden Plover (*Pluvialis fluva*);
- An important breeding area for the Red-capped plover (*Charadrius ruficapillus*); and
- An important breeding area for the Pied Oystercatcher (*Haematopus longirostris*).

Several recreational and educational values are associated with the site. According to the Directory, fishing, picnicking, sailboarding, swimming, and camping are permitted at the site, and local schools and universities use the area for education and research.

4.6 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The following sub-sections provide a summary of MNES relevant to the Project.

4.6.1 SUMMARY OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Table 4-6 summarises the MNES that occur within the OWF Site and cable envelopes according to the PMST search results (**Appendix A**), less any terrestrial or freshwater species or communities that have been screened out for the marine assessment. Where MNES do not occur within the OWF Site or cable envelopes, key MNES (particularly sites or ecological communities) that have the potential to be indirectly impacted by the Project and support species relevant to the Project Area are identified.

TABLE 4-6 SUMMARY OF MNES WITHIN THE OWF SITE AND CABLE ENVELOPES

MNES	OWF Site	Cable Envelopes
Wetlands of International Importance (Ramsar)	<p>None</p> <p>The closest Ramsar site is Corner Inlet, located 25 km north-west of the OWF Site. The Gippsland Lakes Ramsar site is located 37 km north-east of the OWF Site. Important wetlands are described in Section 4.6.4.</p>	<p>None</p> <p>The Corner Inlet Ramsar site is located 11 km to the west of the Offshore Cable Envelope at the closest point. The Gippsland Lakes Ramsar site is located 13 km north-east of the Nearshore Cable Envelope. Important wetlands are described in Section 4.6.4.</p>
Commonwealth Marine Area	<p>Yes</p> <p>Generally, the Commonwealth Marine Area stretches from 3 nm to 200 nm from the coast. The OWF Site is located within the South-east Marine Region, as described in Section 4.6.5. The Beagle AMP is located 12 km south of the OWF Site, as described in Section 4.5.1.</p>	<p>Yes</p> <p>Generally, the Commonwealth Marine Area stretches from 3 nm to 200 nm from the coast. The cable envelopes are located within the South-east Marine Region, as described in Section 4.6.5. The Beagle AMP is located 43 km south of the Offshore Cable Envelope, as described in Section 4.5.1.</p>
EPBC Act-Listed TECs	<p>None</p> <p>No TECs are known to occur within the OWF Site.</p>	<p>None</p> <p>No TECs are known to occur within the cable envelopes. Subtropical and Temperate Coastal Saltmarsh TEC (dependent upon regular or intermittent tidal influence) is reported as occurring directly adjacent to the Nearshore Cable Envelope, at the shoreline. The TEC is described in Section 4.6.6.</p>
EPBC Act-Listed Threatened Species	<p>39</p> <p>Listed Threatened species that were identified by the desktop review as potentially occurring within the OWF Site are identified and described in Section 4.6.7.</p>	<p>47</p> <p>Listed Threatened species that were identified by the desktop review as potentially occurring within the cable envelopes are identified and described in Section 4.6.7.</p>
EPBC Act-Listed Migratory Species	<p>39</p> <p>Migratory species that were identified by the desktop review as potentially occurring within the OWF Site are</p>	<p>56</p> <p>Migratory species that were identified by the desktop review as potentially occurring within the cable envelopes</p>

MNES	OWF Site	Cable Envelopes
	identified and described in Section 4.6.7.	are identified and described in Section 4.6.7.
Birds	33 (20 Threatened and Migratory, 7 Threatened but not Migratory, 4 Migratory but not Threatened)	46 (24 Threatened and Migratory, 10 Threatened but not Migratory, 13 Migratory but not Threatened)
	Threatened and Migratory Birds identified by the desktop review as potentially occurring within the OWF Site are identified and described in Section 4.6.7.1.	Threatened and Migratory Birds identified by the desktop review as potentially occurring within the cable envelopes are identified and described in Section 4.6.7.1.
Marine Mammals	8 (4 Threatened and Migratory, 4 Migratory but not Threatened)	8 (4 Threatened and Migratory, 4 Migratory but not Threatened)
	Threatened and Migratory Marine Mammals identified by the desktop review as potentially occurring within the OWF Site are identified and described in Sections 4.6.7.2 and 4.6.7.3.	Threatened and Migratory Marine Mammals identified by the desktop review as potentially occurring within the cable envelopes are identified and described in Sections 4.6.7.2 and 4.6.7.3.
Marine Turtles	3 (3 Threatened and Migratory)	3 (3 Threatened and 3 Migratory)
	Threatened and Migratory Marine Turtles identified by the desktop review as potentially occurring within the OWF Site are identified and described in Section 4.6.7.4.	Threatened and Migratory Marine Turtles identified by the desktop review as potentially occurring within the cable envelopes are identified and described in Section 4.6.7.4.
Fish (MNES only, does not include species listed as Conservation Dependent)	5 (2 Threatened and Migratory, 1 Threatened but not Migratory, 2 Migratory but not Threatened)	5 (2 Threatened and Migratory, 1 Threatened but not Migratory, 2 Migratory but not Threatened)
	Threatened and Migratory Fish, Sharks and Rays identified by the desktop review as potentially occurring within the OWF Site are identified and described in Section 4.6.7.5.	Threatened and Migratory Fish, Sharks and Rays identified by the desktop review as potentially occurring within the cable envelopes are identified and described in Section 4.6.7.5.
	Migratory species that were identified by the desktop review as potentially occurring within the OWF Site are identified and described in Section 4.6.7.	Migratory species that were identified by the desktop review as potentially occurring within the cable envelopes are identified and described in Section 4.6.7.

4.6.2 RAMSAR WETLANDS

No Ramsar wetlands occur within the OWF Site or the cable envelopes. The Corner Inlet Ramsar site is located approximately 25 km from the OWF Site, 11 km west of the Offshore Cable Envelope and 20 km south-west of the Nearshore Cable Envelope (**Figure 4-5**). The Gippsland Lakes Ramsar site is located 37 km north-east from the OWF Site and 13 km north-east from the Nearshore Cable Envelope (**Figure 4-5**). Although the wetlands do not occur within the OWF Site or cable envelopes, they are described in this report given that they are subject to coastal intertidal influences, support migratory shorebirds and given their proximity to the Project. The potential for indirect impacts to these sites is considered in **Section 5**.

These Ramsar wetlands and their defining characteristics are described previously in **Section 4.5.3**.

4.6.3 COMMONWEALTH MARINE AREA

The Commonwealth Marine Area is any part of the sea, including the waters, seabed, and airspace, within Australia's exclusive economic zone (EEZ) and/or over the continental shelf of Australia, that is not state or Northern Territory waters. The protection of the Commonwealth Marine Area includes the protection of its habitats, the functioning or integrity of its marine ecosystems, and populations of marine species (Commonwealth of Australia 2013).

The Commonwealth waters of the Project Area are within the South-east Marine Region of the Commonwealth Marine Area. Key Ecological Features (KEFs)¹⁰ in the South-east Marine Region include the 'Bonney coast upwelling', the 'East Tasmania subtropical convergence zone', the 'Bass cascade', the 'Upwelling east of Eden', 'Big horseshoe canyon', 'West Tasmania canyons', 'Seamounts south and east of Tasmania', and 'Shelf rocky reefs and hard substrates' (Commonwealth of Australia, 2015a). However, no KEFs occur within or near the Project Area.

Marine protected areas are areas which are recognised to have high conservation value. Actions in or near marine protected areas have a greater likelihood of significant impacts on the Commonwealth Marine Area (Commonwealth of Australia 2013a). Fourteen AMPs are within the South-east Marine Region, including the Beagle Marine Park, which is located 12 km south of the OWF Site (as outlined in **Section 4.5.1**).

EPBC Act-listed Threatened and Migratory species in the South-east Marine Region that are considered relevant to the Project are identified in **Section 4.6.7**.

4.6.4 THREATENED ECOLOGICAL COMMUNITIES

Ecological communities are a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat (DAWE, 2021). Ecological communities are important because of their unique combination of native biodiversity, distinctive landscape/seascape values, vital habitat qualities and for the ecosystem services they provide. An ecological community is listed as Threatened (i.e. TEC) when it is at risk of extinction; the natural composition and function of the ecological community have been significantly depleted across its full range (DAWE, 2021).

The Australian Government recognises TECs on the basis of consultation with scientists about the long-term survivability of a community. Commonwealth TECs are classed as MNES and are protected under Part 3 of the EPBC Act.

The PMST search results (**Appendix A**) detected no TECs in the OWF Site. The PMST detected two TECs within the search buffer for the Nearshore Cable Envelope, 'Subtropical and Temperate Coastal Saltmarsh' and 'Natural Damp Grassland of the Victorian Coastal Plains'. Upon more detailed review, it was confirmed that neither TEC occurs within the Nearshore Cable Envelope. The Natural Damp Grassland of the Victorian Coastal Plains TEC is a terrestrial community and is not considered further in this Preliminary Marine Assessment Report. The

¹⁰ KEFs are features of ecological importance in the Commonwealth marine environment. They are elements of the region that, based on current scientific understanding, are considered to be of regional importance for either biodiversity or ecosystem function and integrity. Though identified as being of ecological importance, KEFs are not protected MNES under the EPBC Act.

Subtropical and Temperate Coastal Saltmarsh TEC also does not occur within the Nearshore Cable Envelope; however, the ecology of the TEC can extend into intertidal areas and is dependent upon regular or intermittent tidal influence.

As presented in **Section 4.3, Figure 4-4**, areas of coastal saltmarsh and estuarine wetland that could potentially meet the TEC's community diagnostic characteristics are found at the coast of Franklin channel and Corner Inlet to the west of the cable envelopes, and at Jack Smith Lake and discrete areas behind the vegetated coastal dune system that extent along the coast adjacent to the Nearshore Cable Envelope. Based on a review of aerial and satellite imagery, the nearest areas of coastal saltmarsh is separated from the Nearshore Cable Envelope by this dune system with a minimum separation distance of 30 m, though the separation distance is greater at other locations along the northern boundary of the Nearshore Cable Envelope. The nearest tide-swept channel that allows for tidal exchange between the ocean and these coastal saltmarsh areas appears to be located at McLoughlin's Channel (part of the broader Corner Inlet system), approximately 15 km west of the Offshore Cable Envelope and 26 km south-west of the Nearshore Cable Envelope.

As Subtropical and Temperate Coastal Saltmarsh TEC does not occur within the cable envelopes it will not be directly disturbed by offshore Project activities. However, given the proximity of coastal saltmarsh to the Nearshore Cable Envelope, and given that the coastal saltmarsh communities are dependent on tidal influences, the TEC is considered relevant to this report. Subtropical and Temperate Coastal Saltmarsh TEC is described further in **Section 4.6.6.1** below.

4.6.4.1 SUBTROPICAL AND TEMPERATE COASTAL SALTMARSH

The Subtropical and Temperate Coastal Saltmarsh TEC is listed as Vulnerable under the EPBC Act. This ecological community occurs within a relatively narrow margin of the Australian coastline. Whilst this community spans six states, it is predominantly found within the subtropical and temperate climatic zones of south-east Queensland to South Australia. In Victoria, this community could occur along the entire Victorian coastline; surveys are required to confirm its presence in a particular area.

The TEC is mainly associated with the soft substrate shores of estuaries and sandy or muddy embayments. The community is influenced by the tidal regime, temperature and local rainfall. The ecological community consists mainly of salt-tolerant vegetation, including grasses, herbs, sedges, rushes and shrubs. The TEC is found in coastal areas under regular or intermittent tidal influence, and it is typically restricted to upper intertidal areas with soft sediments generally consist of poorly-sorted anoxic sandy silts and clay (Department of Environment, n.d.). The drainage characteristics of coastal soils, along with tidal patterns and elevation, can strongly influence the distribution of flora and fauna within the Coastal Saltmarsh ecological community.

The TEC occurs in multiple locations along the Gippsland coast, including Corner Inlet, Jack Smith Lake, Lake Denison, Lake Reeve and other discrete areas behind the vegetated dunes that run parallel with Ninety Mile Beach.

A high diversity of infaunal and epifaunal invertebrates are associated with the TEC. The dominant marine invertebrates are crabs of the families Grapsidae and Ocypodidae. Molluscs are also common in the TEC, and include bivalves, sea slugs of the family Onchidiidae, and

several families of gastropods. Shrimp and prawns can swim against currents and are regular, transient visitors to the TEC when it is linked to adjacent aquatic habitats at high tide.

Transient fish assemblages are found in the TEC when it is inundated at high tide. These fish are typically adult glassfish (Ambassidae), hardyheads (Atherinidae), or gobies (Gobiidae). Fish assemblages are low in biodiversity: 60 – 90% of the total fish abundance is comprised of just one or two species (Connelly, 2009). The TEC provides important feeding, roosting and refuge habitat for resident and migratory shorebirds (including colonial water birds), as well as foraging habitat for insectivorous bats, terrestrial birds of prey, and seed-eating and insectivorous birds.

The Coastal Saltmarsh provides extensive ecosystem services such as:

- filtering surface water prior to it entering the sea;
- carbon sequestration;
- coastal productivity;
- providing nursery habitat to a range of fisheries species; and
- provision of food and nutrients for migratory shorebirds.

Conservation advice for this community has been in effect since 2013 (Commonwealth of Australia, n.d.(a)), and lists 14 processes that threaten the Coastal Salt Marsh community. These threatening processes include land clearing, eutrophication and pollution, the introduction of non-native plants, and altered hydrology or tidal restriction. No Recovery Plan has been made or adopted for this ecological community.

4.6.5 THREATENED AND MIGRATORY SPECIES

The desktop review (**Appendix A**) identified the potential occurrence of:

- 39 Threatened species and 39 Migratory species as potentially occurring within the OWF Site. Of these, 29 species are listed as both Threatened and Migratory, 10 as Threatened but not Migratory and 10 as Migratory but not Threatened.
- 47 Threatened species and 56 Migratory species as potentially occurring within the cable envelopes (excluding terrestrial and freshwater species not considered relevant to the offshore Project Area). Of these, 34 species are listed as both Threatened and Migratory, 13 as Threatened but not Migratory and 20 as Migratory but not Threatened.

Section 4.6.7.1 to **Section 4.6.7.5** list and describe the species identified by the desktop review as potentially occurring within the OWF Site and cable envelopes that have the potential to be impacted by the Project, as well as overlapping Biologically Important Areas.

4.6.5.1 BIRDS

The desktop review (**Appendix A**) identified the potential occurrence of 31 Threatened or Migratory birds within the OWF Site and 47 Threatened or Migratory Birds within the cable envelopes (excluding terrestrial and freshwater species not considered relevant to the offshore Project Area). **Table 4-7** lists the Threatened and Migratory species identified as potentially occurring within the OWF Site and cable envelopes.

Seabirds

Table 4-7 lists the Threatened and Migratory species identified as potentially occurring within the OWF Site and cable envelopes.

The OWF Site and cable envelopes overlap with foraging BIAs for a number of these Threatened and Migratory seabirds, as identified in **Table 4-8** and **Figure 4-6**. BIAs are defined for several listed Threatened and/or Migratory albatross species; the foraging BIAs for these species are extensive and include the entire South-east Marine Region of Australia. Foraging BIAs are also defined for Common Diving Petrel (*Pelecanoides urinatrix*) and White-Faced Storm Petrel (*Pelagodroma marina*). These species are listed as Marine under the EPBC Act, but are not listed as Threatened or Migratory (i.e. they are not MNES). The foraging BIAs for these species extend over large areas of the Bass Strait, eastern Victoria and Tasmania.

In addition to the foraging BIAs, CoastKit identifies Seal Island, Notch Island, Rag Island and Clifly Island (located in state waters between approximately 12 km and 14 km west of the OWF Site) as being rookeries for the following EPBC Act-listed Migratory species:

- Short-tailed Shearwater (*Ardenna tenuirostris*) – listed Migratory; and
- Crested Tern (*Thalasseus bergii*) – listed Migratory.

Notably, Crested Tern was not previously identified in the PMST Search (**Appendix A**) as a Migratory species occurring in the OWF Site or cable envelopes, despite the presence of the breeding colony.

The islands are also rookeries for other EPBC Act-listed Marine species, Fairy Prion (*P. t. turtur*), Little Penguin (*Eudyptula minor*), Common Diving Petrel (*Pelecanoides urinatrix*), Black Faced Cormorant (*Phalacrocorax fuscescens*), Pacific Gull (*Larus pacificus*) and Silver Gull (*Chroicocephalus novaehollandiae*). Although the additional Marine species are not listed as Threatened or Migratory species under the EPBC Act (i.e., they are not MNES), they are noted for their proximity to the OWF Site.

Shorebirds

The OWF Site and cable envelopes have the potential to interact with numerous shorebirds as identified in **Table 4-7**, notably the following EPBC Act-listed Critically Endangered or Endangered species:

- Curlew Sandpiper (Critically Endangered, Migratory);
- Far Eastern Curlew (Critically Endangered, Migratory);
- Red Knot (Vulnerable, Migratory); and
- Lesser Sand Plover (Endangered, Migratory).

The Corner Inlet Ramsar wetland is located 11 km west of the Offshore Cable Envelope, and the Gippsland Lakes Ramsar wetland is located 13 km north-east of the Nearshore Cable Envelope (**Figure 4-5**). The wetlands are an important area for migratory shorebirds and waders (**Figure 4-7**), supporting numerous Threatened and Migratory species as described in **Section 4.5.3**.

TABLE 4-7 EPBC ACT-LISTED THREATENED AND MIGRATORY BIRD SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Seabirds							
Shy Albatross	<i>Thalassarche cauta</i>	Endangered, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Grey-headed Albatross	<i>Thalassarche chrysostoma</i>	Endangered, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Northern Royal Albatross	<i>Diomedea sanfordi</i>	Endangered, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Southern Royal Albatross	<i>Diomedea epomophora</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Wandering Albatross	<i>Diomedea exulans</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Sooty Albatross	<i>Phoebastria fusca</i>	Vulnerable, Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat may occur within area
Buller's Albatross	<i>Thalassarche bulleri</i>	Vulnerable, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>	Vulnerable, Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Antipodean Albatross	<i>Diomedea antipodensis</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Campbell Albatross	<i>Thalassarche impavida</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Black-browed Albatross	<i>Thalassarche melanophris</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Salvin's Albatross	<i>Thalassarche salvini</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
White-capped Albatross	<i>Thalassarche steadi</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour known to occur within area	✓	✓	Foraging, feeding or related behaviour known to occur within area
Northern Buller's Albatross	<i>Thalassarche bulleri platei</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Gibson's Albatross	<i>Diomedea antipodensis gibsoni</i>	Vulnerable	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Flesh-footed Shearwater	<i>Ardenna carneipes</i>	Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Sooty Shearwater	<i>Ardena grisea</i>	Vulnerable, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Gould's Petrel	<i>Pterodroma leucoptera leucoptera</i>	Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Southern Giant-Petrel	<i>Macronectes giganteus</i>	Endangered, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Northern Giant Petrel	<i>Macronectes halli</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
White-bellied Storm-Petrel	<i>Fregetta grallaria grallaria</i>	Vulnerable	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Blue Petrel	<i>Halobaena caerulea</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Little Tern	<i>Sternula albifrons</i>	Migratory	X	N/A	✓	✓	Species or species habitat may occur within area
Australian Fairy Tern	<i>Sternula nereis nereis</i>	Vulnerable	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Species or species habitat known to occur within area
Fairy Prion	<i>Pachyptila turtur subantarctica</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Short-tailed shearwater	<i>Ardenna tenuirostris</i>	Migratory	✓***	N/A – Not identified in PMST search, but in VBA and foraging BIA overlaps	✓*	✓*	N/A – Not identified in PMST or VBA searches, but foraging BIA overlaps
Crested Tern	<i>Thalasseus bergii</i>	Migratory	✓***	N/A – Not identified in PMST search, but in VBA and rookery nearby	✓***	✓***	N/A – Not identified in PMST search, but in VBA and rookery nearby
Shorebirds							
Curlew Sandpiper	<i>Calidris ferruginea</i>	Critically Endangered, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Far Eastern Curlew	<i>Numenius madagascariensis</i>	Critically Endangered, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Red Knot	<i>Calidris canutus</i>	Vulnerable, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Australian Painted Snipe	<i>Rostratula australis</i>	Endangered	X	N/A	✓	✓	Species or species habitat likely to occur within area
Greater Sand Plover	<i>Charadrius leschenaultii</i>	Vulnerable, Migratory	X	N/A	✓	✓	Species or species habitat likely to occur within area
Eastern Hooded Plover	<i>Thinornis cucullatus</i>	Vulnerable	X	N/A	✓	✓	Species or species habitat known to occur within area

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Nunivak Bar-tailed Godwit	<i>Limosa lapponica baueri</i>	Endangered	X	N/A	✓	✓	Species or species habitat may occur within area
Common Sandpiper	<i>Actitis hypoleucos</i>	Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Vulnerable, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Pectoral Sandpiper	<i>Calidris melanotos</i>	Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Lesser Sand Plover	<i>Charadrius mongolus</i>	Endangered, Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Ruddy Turnstone	<i>Arenaria interpres</i>	Migratory	X	N/A	✓***	✓***	Species or species habitat known to occur within area
Red-necked Stint	<i>Calidris ruficollis</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Double-banded Plover	<i>Charadrius bicinctus</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Latham's Snipe	<i>Gallinago hardwickii</i>	Vulnerable, Migratory	X	N/A	✓	✓	Species or species habitat likely to occur within area

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Bar-tailed Godwit	<i>Limosa lapponica</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Pacific Golden Plover	<i>Pluvialis fulva</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Common Greenshank	<i>Tringa nebularia</i>	Endangered, Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Sanderling	<i>Calidris alba</i>	Migratory	X	N/A	✓***	✓***	Species or species habitat known to occur within area
Oriental Plover	<i>Charadrius veredus</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Osprey	<i>Pandion haliaetus</i>	Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Fork-tailed swift	<i>Apus pacificus</i>	Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Migratory Land Birds							
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	Critically Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area
Swift Parrot	<i>Lathamus discolor</i>	Critically Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	Migratory	X	N/A	✓	✓	Species or species habitat likely to occur within area
White-throated Needletail	<i>Hirundapus caudacutus</i>	Vulnerable, Migratory	X	N/A	✓	✓	Species or species habitat known to occur within area
Yellow Wagtail	<i>Motacilla flava</i>	Migratory	X	N/A	✓	✓	Species or species habitat may occur within area
Rufous Fantail	<i>Rhipidura rufifrons</i>	Migratory	X	N/A	✓	✓	Species or species habitat likely to occur within area

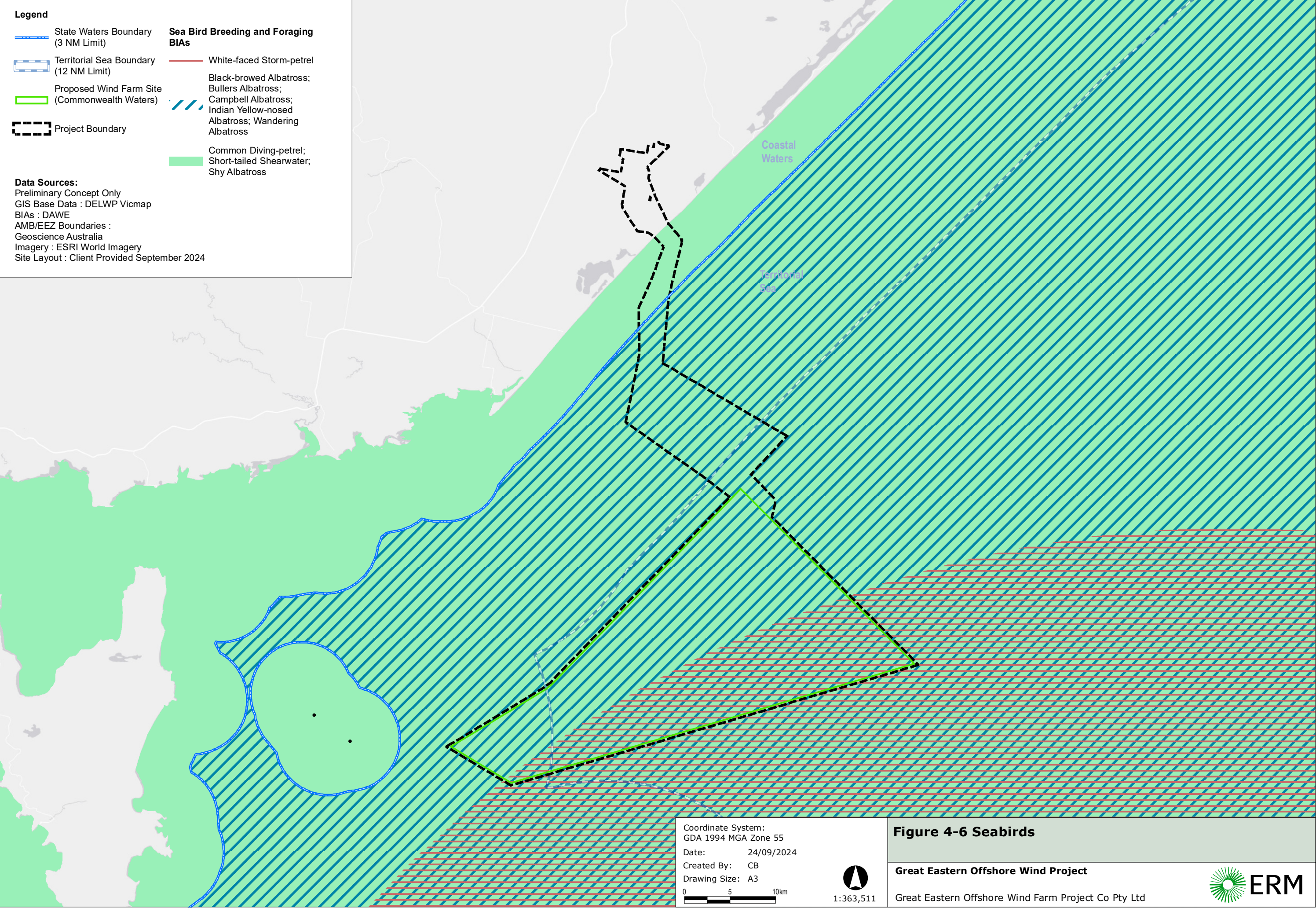
* Species not identified in PMST or VBA search results, but included on the basis that a BIA overlaps with the Project Area.

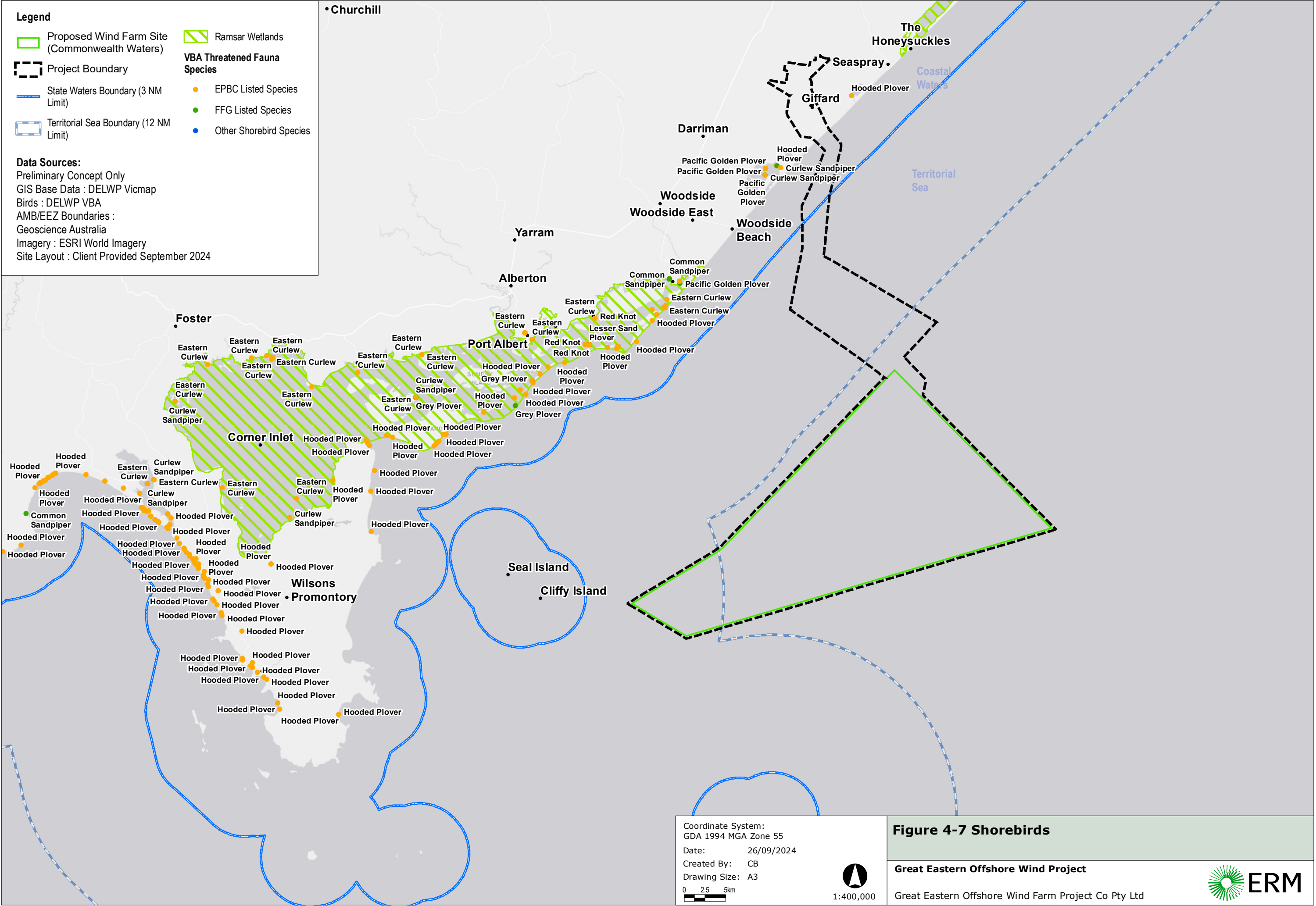
** Species not identified in PMST or VBA search results, but included on the basis that a breeding colony is within 15 km of the Project Area.

*** Detected in VBA results but not in the PMST results.

TABLE 4-8 SEABIRD BIAS WITHIN THE OWF SITE AND CABLE ENVELOPES

Species	BIA	Location	Presence	Distance and Direction from the OWF Site	Distance and Direction from Cable Envelopes
Short-tailed Shearwater	Foraging	Buffer around Tasmania, including Bass Strait	Known to occur	Overlap	Overlap with both cable envelopes
White-faced Storm-Petrel	Foraging	East Gippsland, Port Phillip Bay, Bass Strait, and buffer around northern and eastern Tasmania	Known to occur	Overlap	9 km south of OCE 35 km south of NCE
Common Diving Petrel	Foraging	Buffer around Tasmania and Victoria, including Bass Strait	Known to occur	Overlap	Overlap with both cable envelopes
Wandering Albatross	Foraging	The whole South-east Marine Region	Known to occur	Overlap	Overlap with OCE Directly adjacent to NCE
Black-browed Albatross	Foraging	The whole South-east Marine Region	Known to occur	Overlap	Overlap with OCE Directly adjacent to NCE
Buller's Albatross	Foraging	Most of the South-east Marine Region	Known to occur	Overlap	Overlap with OCE Directly adjacent to NCE
Campbell Albatross	Foraging	The whole South-east Marine Region including Macquarie Island	Known to occur	Overlap	Overlap with OCE Directly adjacent to NCE
Indian Yellow-nosed Albatross	Foraging	Most of the South-east Marine Region	Known to occur	Overlap	Overlap with OCE Directly adjacent to NCE
Shy Albatross	Foraging Likely	The whole South-east Marine Region	Likely to occur	Overlap	Overlap with both cable envelopes





Migratory Land Birds

The Orange-bellied Parrot *Neophema chrysogaster* is listed as critically endangered under the EPBC Act and the FFG Act. It is also covered under provisions for marine species under the EPBC Act. The Orange-bellied Parrot (OBP) is a small (approx. 45g) ground-feeding parrot which breeds in south-west Tasmania and migrates to the coast of south-east mainland Australia for the non-breeding season. OBP nest in hollows of eucalypts that grow in copses in the button-grass plains that dominate coastal south-western Tasmania. Its primary habitat on the mainland is coastal saltmarsh and dune vegetation (DELWP 2016). Migration from Tasmania to the mainland occurs during autumn. The birds overwinter within a narrow zone along the coast, historically extending from eastern South Australia to southern NSW. In recent decades this has largely contracted to a few locations along the coast west of Port Phillip Bay. The migration back to Tasmania occurs in spring to summer.

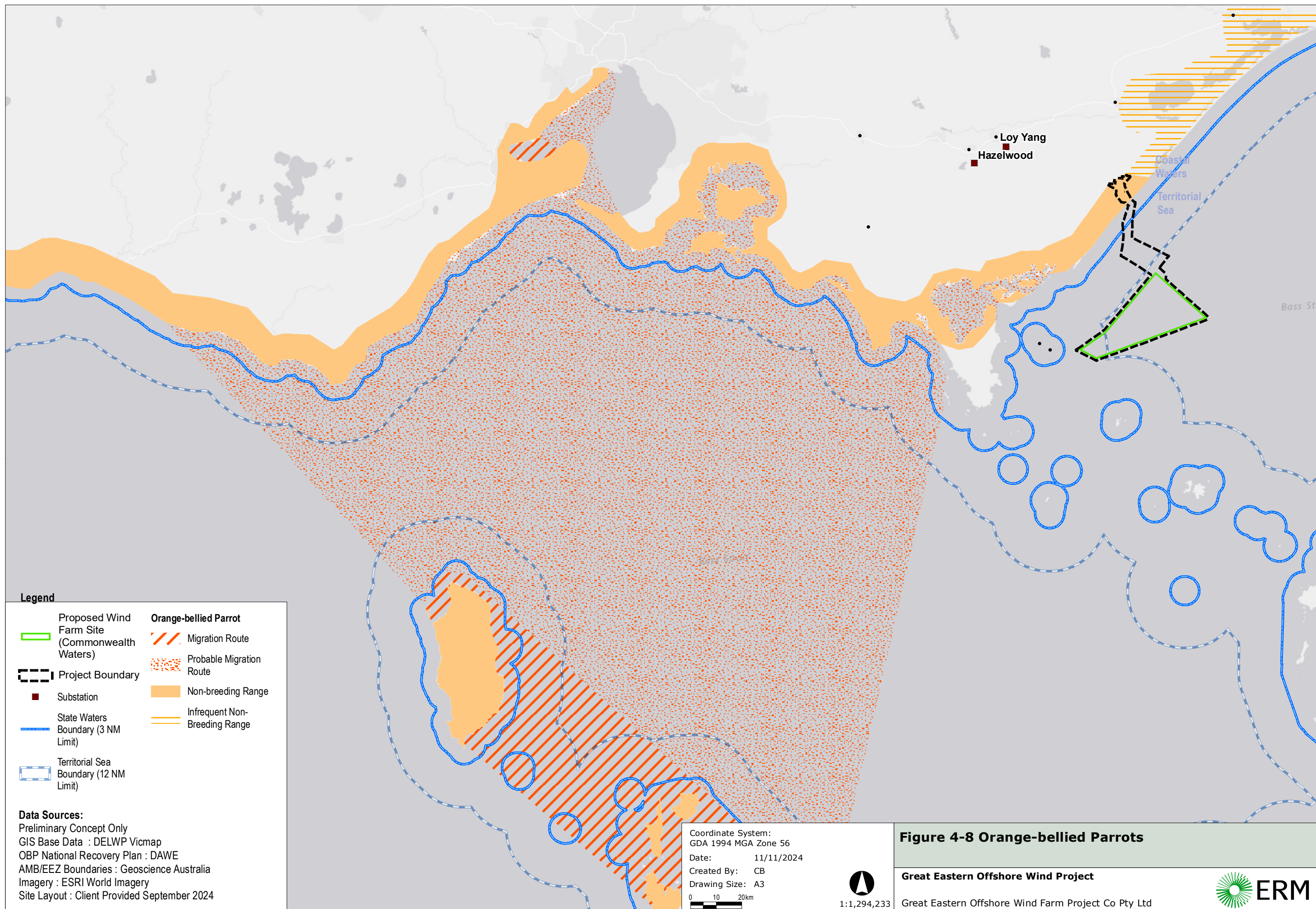
The OBP 'probable migration route' (**Figure 4-8**) as shown on the map in the Recovery Plan (DELWP 2016) notes that it was compiled from information supplied by the Recovery Team in 2012. An assessment of the species carried out by BirdLife (2020), for the Department of the Environment and Energy (now DCCEEW) discusses autumn migration and considers the potential for landfall in Victoria only between Cape Otway in the west and Lake Connewarre in the east. By comparison with the wide 'probable migration route' shown on the Recovery Plan map, this is a significantly smaller migration passage zone restricted to an area between the north of King Island and the coast of Victoria west of Port Phillip Bay. Thus, the most contemporary knowledge available indicates it is very unlikely that Orange bellied Parrots cross Bass Strait to the east of Port Phillip Heads (which is ~220 km northeast of the GEOW OWF Site). On the southward migration, individually identified Orange-bellied Parrots have been noted to arrive in south-western Tasmania within as little as 24 hours of having been observed at the Western Treatment Plant in southern Victoria. This is suggestive of a direct southward migration. It seems probable that the birds cross Bass Strait passing over King Island and then fly down western Tasmania to reach Melaleuca. In the current situation in which virtually all known birds have overwintered in western Victoria, this would represent the shortest return route (Birdlife 2020). Noting the above and that the GEOW project site is outside the migration zone as mapped by the Recovery Plan and that the probability of Orange-bellied Parrots encountering a wind farm at that site is negligible.

The OBP non-breeding range includes coastal habitat in South Australia, Victoria (including Corner Inlet) and to a lesser extent in southern New South Wales. Non-breeding habitat does not occur within the offshore Project Area but is adjacent to the Nearshore Cable Envelope, therefore, the species may occasionally overfly coastal waters. Noting the likely migration route for Orange-bellied Parrots, and the distance of the OWF Site from the coast, there is a low likelihood of Orange-bellied Parrots being offshore in the OWF Site.

The Swift Parrot *Lathamus discolor* is listed as critically endangered under the EPBC Act 1999 and FFG Act 1988. It is also covered under provisions for marine species under the EPBC Act. Swift Parrots breed in eastern, and to a lesser extent in north-western Tasmania during late spring and summer. The entire population migrates across Bass Strait in autumn to over-winter in the south-eastern mainland (Saunders and Tzaros 2011).

The migration route of Swift Parrots is less well defined than for Orange-bellied parrots. The entire population is understood to migrate north from Tasmania to the mainland, dispersing throughout the eastern states of Australia (**Appendix C**).

Two other Threatened or Migratory land birds (Satin Flycatcher, White-throated Needle-tail) may also occur infrequently in the OWF Site and cable envelopes, as they migrate between Victoria and Tasmania.



4.6.5.2 CETACEANS

The desktop review (**Appendix A**) identified the potential occurrence of four cetacean species within the OWF Site and cable envelopes listed as Threatened and Migratory, and an additional four species listed as Migratory but not Threatened (**Table 4-9**). Species with Biologically Important Areas overlapping the OWF Site and cable envelopes are shown in **Table 4-10**. A summary of each species is provided below.

The desktop review (**Appendix A**) also identified six other EPBC Act-listed 'Cetacean' species as potentially occurring within the OWF Site and cable envelopes (Common Dolphin, Risso's Dolphin, Bottlenose Dolphin, Minke Whale, Indian Ocean Bottlenose Dolphin, False Killer Whale). These species are listed as Cetaceans under the EPBC Act but are not listed as Threatened or Migratory and are, therefore, not MNES.

Blue whale

The largest animal on Earth, the Blue Whale (*Balaenoptera musculus*), is listed as Endangered and Migratory under the EPBC Act. Two subspecies are found in the Southern Hemisphere: the larger Antarctic or 'true' Blue Whale (*B. m. intermedia*) and the relatively smaller Pygmy Blue Whale (*B. m. breviceauda*) (PBW). Like most baleen whales, blue whales generally undertake an annual migration from higher latitude feeding grounds in summer to lower latitude breeding grounds in winter.

Three recognised populations are found in Australia: 1) Antarctic Blue Whales (AB) that feed in waters south of 60°S in summer, with a proportion that migrate to lower latitudes in the Indian and Pacific Oceans to breed in winter; 2) Eastern Indian Ocean Pygmy Blue Whales (EIO PB) that feed in waters along the southern and western coasts of Australia and migrate up the west coast to breeding grounds as far north as Indonesia; and 3) New Zealand Pygmy Blue Whales (NZ PB) found along the eastern Australian coast, in New Zealand and the western Pacific Ocean. Little is known about the migrations of NZ PB and AB compared with EIO PB, but all three populations are likely to overlap in Bass Strait, with McCauley et al. (2018) having recorded all three call types in April-May 2004. Synthesizing acoustic data from Antarctica, Australia and New Zealand, Barlow et al. (2023) showed the presence of blue whales in the area offshore eastern Victoria as predominately rare or vagrant individuals from the New Zealand population, with inferred presence of migrating Antarctic blue whales. Animals are likely to be migrating through the area rather than forming strong seasonal foraging aggregations, although opportunistic feeding may occur.

Known feeding aggregations of blue whales can be found at Perth Canyon in WA and at the Bonney Upwelling system, which forms offshore from Robe, SA to approximately Cape Otway, Victoria each year. These areas are considered annual high-use Biologically Important Areas for this species, important to their survival as they seasonally support highly productive waters on which significant aggregations of whales rely. Within-season movements of whales are influenced by abundance and movements of prey, but Blue Whales are generally found feeding on krill over the continental shelf at the western end of the Bonney Upwelling in November-December, moving south-eastward along the shelf towards Cape Otway during January to April, before leaving the feeding grounds and beginning the migration west and then north around April to July (Gill et al. 2011, Moller et al. 2020). Gill et al. (2011) recorded 78% of Blue Whales sighted between Cape Nelson and Cape Otway at depths of 50-150 m. Moller et

al. (2020) also found a small number of tagged whales, including a mother-calf pair, moving over the continental slope and deep-sea in waters between Tasmania and the mainland, suggesting some feeding may occur in deeper waters.

Although the main feeding areas are located west of the OWF Site and cable envelopes, with the Bonney Upwelling considered the primary foraging area for blue whales in south-eastern Australia, feeding is also known to occur in the area from Cape Otway to Port Phillip Heads and south to King Island and is likely to occur in the majority of the Bass Strait and coastal waters of Tasmania. These areas are also considered to be BIAs for this reason (**Figure 4-9**).

TABLE 4-9 EPBC ACT-LISTED THREATENED AND MIGRATORY CETACEAN SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Blue Whale	<i>Balaenoptera musculus</i>	Endangered, Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Southern Right Whale	<i>Eubalaena australis</i>	Endangered, Migratory	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area
Sei Whale	<i>Balaenoptera borealis</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	X	Foraging, feeding or related behaviour likely to occur within area
Fin Whale	<i>Balaenoptera physalus</i>	Vulnerable, Migratory	✓	Foraging, feeding or related behaviour likely to occur within area	✓	X	Foraging, feeding or related behaviour likely to occur within area
Humpback Whale	<i>Megaptera novaeangliae</i>	Migratory ¹¹	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area
Pygmy Right Whale	<i>Caperea marginata</i>	Migratory	✓	Foraging, feeding or related behaviour may occur within area	✓	✓	Foraging, feeding or related behaviour may occur within area
Dusky Dolphin	<i>Lagenorhynchus obscurus</i>	Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Killer Whale	<i>Orcinus orca</i>	Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area

¹¹ Humpback whales were previously listed as Vulnerable under the EPBC Act but were removed from the Threatened species list on 26 February 2022 after a review of their status.


TABLE 4-10 CETACEAN BIAS WITHIN THE OWF SITE AND CABLE ENVELOPES

Species	BIA	Location	Presence	Distance and Direction from the OWF Site	Distance and Direction from Cable Envelopes
Pygmy Blue Whale	Foraging	The majority of the Bass Strait and coastal waters of Tasmania	Likely to be present	Overlap	Overlap with both cable envelopes
Southern Right Whale	Reproduction	All state coastal waters out to 2.5 km from shore, as well as around Tasmania	Known to occur	23 km north-west at the closest point	Overlap with Nearshore Cable Envelope 3 km north-west from Offshore Cable Envelope
Southern Right Whale	Migration	All waters from Cape Leeuwin (WA) to Eden (NSW) out to the 200 nm Commonwealth marine area boundary	Known to occur	Overlap	Overlap with both cable envelopes

Legend

 Project Boundary

 Proposed Wind Farm Site (Commonwealth Waters)

 State Waters Boundary (3 NM Limit)

 Territorial Sea Boundary (12 NM Limit)

Data Sources:

Preliminary Concept Only

GIS Base Data : DELWP Vicmap

BIAs : DAWE

AMB/EEZ Boundaries : Geoscience Australia

Imagery : ESRI World Imagery

Site Layout : Client Provided September 2024

Atlas of Living Australia occurrence download at


<https://biocache.ala.org.au/occurrences/search?q=qid:1648271244108> accessed on 26 March 2022


Atlas of Living Australia Records


 Blue Whale

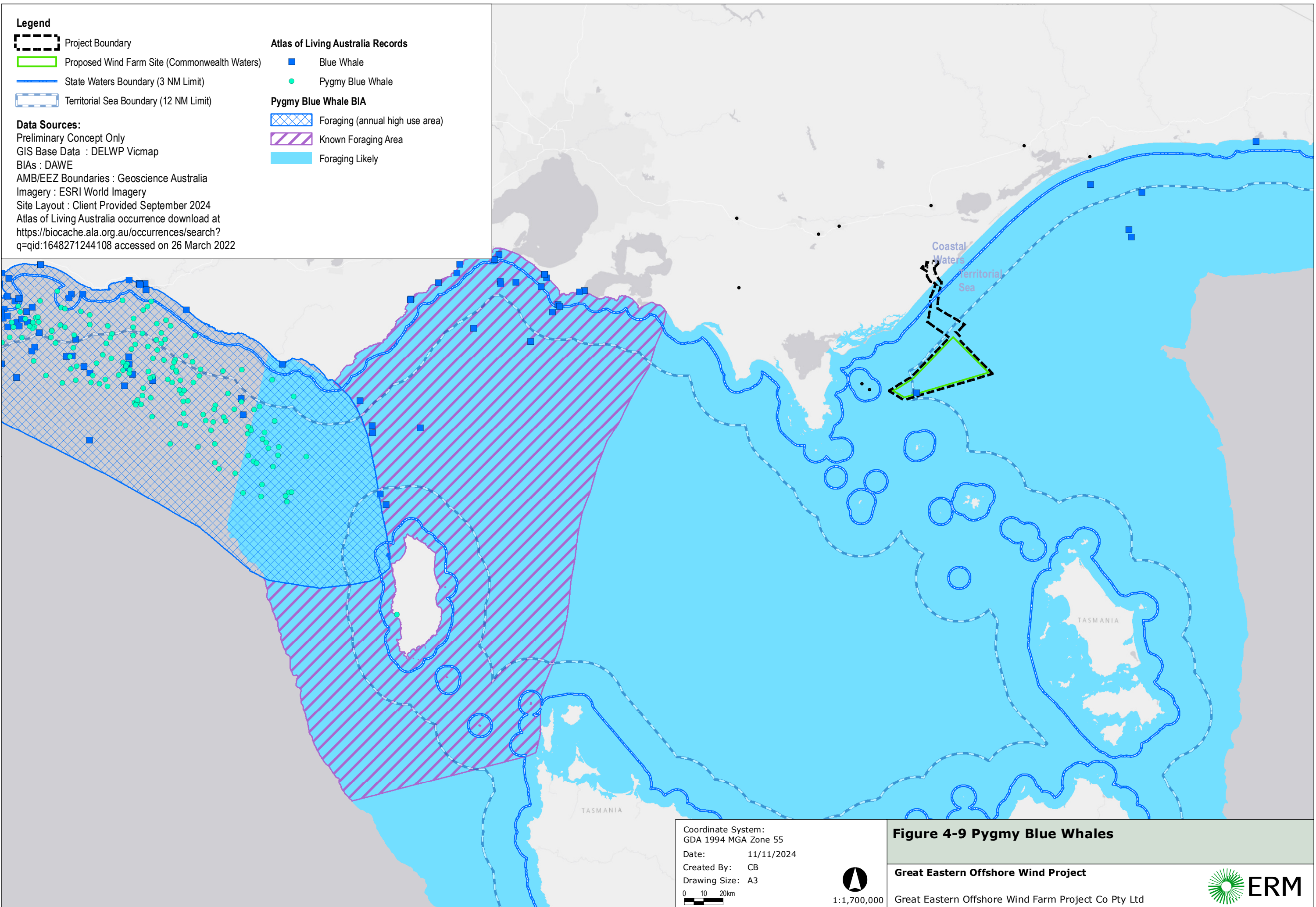
 Pygmy Blue Whale

Pygmy Blue Whale BIA

 Foraging (annual high use area)

 Known Foraging Area

 Foraging Likely



Coordinate System:
GDA 1994 MGA Zone 55

Date: 11/11/2024

Created By: CB

Drawing Size: A3

0 10 20km



1:1,700,000

Figure 4-9 Pygmy Blue Whales

Great Eastern Offshore Wind Project

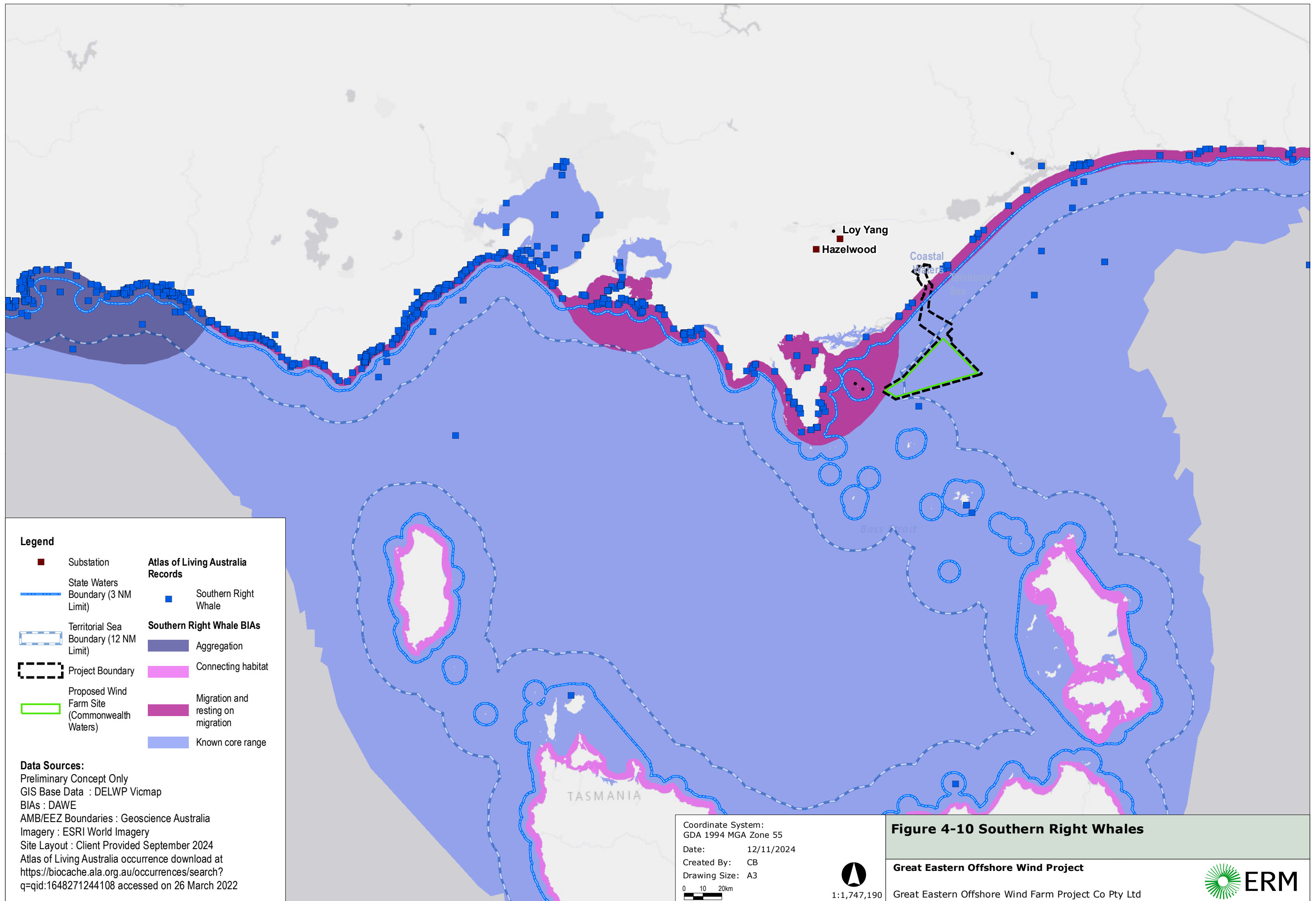
Great Eastern Offshore Wind Farm Project Co Pty Ltd



Southern Right Whale

Southern Right Whales (*Eubalena australis*) were heavily exploited by whaling operations in the 17th-19th centuries, with the total Southern Hemisphere population estimated to have been reduced from >70,000 in 1770 to approximately 300 individuals by the 1920s. Recent best estimates suggest the total Southern Hemisphere population numbered 13,600 individuals in 2009 (IWC 2013). In Australia, two sub-populations are found: the south-western subpopulation found off Western Australia and South Australia numbering around 2,585-3,164 (Smith et al. 2021), and the south-eastern subpopulation off Victoria, New South Wales and Tasmania estimated to comprise around 270 individuals (Stamation et al. 2020). Stamation et al. (2020) estimated a median annual increase in the average number of Southern Right Whales using the southeastern coastline at 7.3% from 1985 to 2017. Although Southern Right Whales are listed as Least Concern in the International Union for Conservation of Nature (IUCN) Red List, they are listed as Endangered and Migratory under the EPBC Act.

Southern Right Whales generally migrate from foraging areas south of Australia between ~40°S and 65°S to Australian coastal waters where they can be found from late April to November. Southern Right Whale BIAs were updated in August 2023, including a large expansion of the Migration BIA, which now includes all southern Australian waters out to 200 nm offshore (**Figure 4-10**). The migration BIA overlaps the OWF Site and cable envelopes and is used seasonally from April to October, although numbers are likely to be low due to the small subpopulation size. The Southern Right Whale Reproduction BIA extends intermittently from Hervey Bay (QLD) to Exmouth Gulf (WA) and includes all state waters out to 2.5 km from shore (**Figure 4-10**). Reproduction BIAs across the species range are considered Habitat Critical to the Survival of the species (HCTS), including being critical for recovery in terms of expanding habitat occupancy. In coastal habitat, Southern Right Whales are usually concentrated in aggregation areas in shallow waters, usually within two kilometres of the coast. The main recognised calving ground for the south-eastern subpopulation is found at Warrnambool, Victoria (DSEWPac 2012). Elsewhere in Victoria, small but growing numbers of non-calving whales regularly aggregate for short periods of time in coastal waters off Peterborough, Port Campbell, Port Fairy and Portland (DSEWPac 2012). Breeding may occur in the Wilson's Promontory area, with reports of mating behaviour in the vicinity and at least three mothers with calves recorded near the area (Stamation et al. 2020, Watson et al. 2021, DCCEEW 2024).



Sei Whale

Sei Whales (*Balaenoptera borealis*) are listed as Vulnerable and Migratory under the EPBC Act. They are found throughout the Southern Hemisphere, mainly in deep water, oceanic habitats and are thought to migrate from summer feeding grounds in subpolar waters to winter breeding grounds in lower latitudes. Historic records often confounded Sei Whales with Bryde's Whales, while recent records of this species are limited. In southern Australian waters, Miller et al. (2012) recorded one Sei Whale during vessel surveys off Portland, while Gill et al. (2015) sighted 14 Sei Whales during 11 years of aerial surveys in the area from the eastern Great Australian Bight to western Bass Strait. The latter sightings were at a mean depth of 160 m and included records of feeding on five occasions, suggesting Sei Whales may use the area for at least opportunistic feeding. Sei Whale mother-calf pairs have also been observed south of Hobart, Tasmania (Ensor et al. 2002). There are no known calving or mating areas and no Biologically Important Areas have been identified for this species in Australia. Given the wide-ranging behaviour of this species and the confirmed sightings of Sei Whales to the west and south of the Project Area, it is possible the species could occur in the area. Sightings are less likely in the Nearshore Cable Envelope than in the Offshore Cable Envelope and OWF Site.

Fin Whale

Fin Whales (*Balaenoptera physalus*) are the second largest whale species and are found mainly, but not exclusively, in deeper offshore waters. Over 720,000 fin whales were recorded killed by whaling operations in the Southern Hemisphere between 1904 and 1983, heavily reducing their numbers (Clapham and Baker 2002). Although the current global population size is uncertain, plausible projections suggest the mature population size has recovered to over 30% of the 1940 level (Cooke 2018). In Australia, Fin Whales are listed as Vulnerable and Migratory under the EPBC Act.

Southern hemisphere Fin Whales are generally found in temperate and subpolar waters, undertaking annual migrations poleward in summer, but their winter distribution is poorly known. There are no known Biologically Important Areas for Fin Whales in Australia and no known mating or calving areas have been defined. Records of this species on the southern coasts of Australia are limited. Aulich et al. (2019) recorded over 22,500 hours of acoustic recordings over a nine-year period at Portland, Victoria, with only six hours of Fin Whale calls recorded during this time. However, numerous sightings have been recorded in South Australia and in the vicinity of the Bonney Upwelling in recent decades (Gill 2002, Morrice et al. 2004, Miller et al. 2012, Gill et al. 2015), including evidence of feeding behaviour. Gill et al. (2015) sighted eight Fin Whales between the months of November to February during 11 years of aerial surveys from the eastern Great Australian Bight to western Bass Strait, with a mean depth of 162 m for these whales. Although records of the species in the Bass Strait are infrequent, Fin Whales may migrate through the OWF Site and Offshore Cable Envelope, and possibly feed in the region, although numbers are likely to be low. Sightings are less likely in the Nearshore Cable Envelope.

Humpback Whale

The Humpback Whale (*Megaptera novaeangliae*) is widely distributed in all oceans. Humpback Whales undertake annual migrations between high-latitude summer feeding grounds and low-latitude winter breeding grounds (Chittleborough 1965, Dawbin 1966). Humpback Whales are

listed as Migratory under the EPBC Act. The Threatened Species Scientific Committee reassessed the Humpback Whale's conservation status in Australia and listing under the EPBC Act and it was removed from the Threatened species list in February 2022 (Commonwealth of Australia 2022a).

The majority of Humpback Whales in Australian waters migrate north from May to August, and back towards the Southern Ocean from September to November. In Australia, Humpback Whales are divided into east coast and west coast populations (TSSC 2021). Recent best estimates of the east coast population suggest it numbered 24,545 whales (95% confidence interval 21,631–27,851) in 2015, with a long-term average annual rate of increase of 10.9% (Noad et al. 2019). The west coast population is more difficult to estimate absolute abundance for and there have been no recent estimates, but absolute abundance estimates of the 2008 west coast population suggest it numbered around 33,000–34,000 individuals (Hedley et al. 2011, Salgado Kent et al. 2012). It is likely the west coast population has increased at close to its maximum biological rate for most of the period since the cessation of whaling (TSSC 2021).

West coast Humpback Whales migrate up the west coast of Australia, as far north as Broome and the Kimberley, while east coast Humpback Whales move up the east coast of Australia to Great Barrier Reef waters. A proportion of the population migrates west of Tasmania and into state waters before continuing towards NSW. During migrations, Humpback Whales move within the continental shelf boundary or 200 m bathymetry (Jenner et al. 2001), usually within 50 km of the coast (TSSC 2015a).

Humpback Whales are sighted in state waters on their migratory path, including sightings along the Gippsland coast (SWIFFT 2021a). Humpback Whales pass through Victoria in the highest numbers during June and July, with some whales passing by during their southern migration in September to October (SWIFFT 2021a). In Victoria, there are reports of Humpback Whale sightings in all months except February (Warneke 1995).

Feeding has been observed in Australia's coastal waters, but it is thought to be primarily opportunistic (TSSC 2015). Gill et al. (2015) observed a juvenile Humpback Whale lunge feeding in the Bonney Upwelling, and during late September to early October 2020, Humpback Whales were observed feeding off Portland (SWIFFT 2021a).

There are no known Biologically Important Areas (feeding, calving and resting) or migratory routes for Humpback Whales within or adjacent to the OWF Site or cable envelopes, however, Humpback Whales may be encountered migrating through the area between May and November.

Pygmy Right Whale

The Pygmy Right Whale (*Caperea marginata*) is the smallest baleen whale, found in temperate and sub-Antarctic waters of the Southern Hemisphere (Kemper 2002). Pygmy Right Whales are not known to be migratory, however they may move north/south depending on reproductive and life history status (Kemper 2002). Currently, the Pygmy Right Whale is listed Migratory under the EPBC Act.

In Australia, Pygmy Right Whales are rarely sighted at sea, and therefore most of what is known comes from strandings (Gill et al. 2008). Eight Pygmy Right Whale were recorded as stranded in Victoria from 1946–2015, including one at Phillip Island (1989) and two at Sealers Cove, Wilson Promontory (1995, 2014) (Kemper et al. 2013, Foord et al. 2019). Gill et al.

(2008) reported a single sighting of 100 Pygmy Right Whales in June 2007, approximately 40 km south-south-west of Portland in the Bonney Upwelling. These whales were observed in water depths of 150 m, approximately 4 km from the 200-m shelf break. This sighting reportedly contained a range of size classes, including calves, near an area where abundant krill surface swarms were present at the time (Gill et al. 2008, 2015). In support of this, Kemper et al. (2013) found that Pygmy Right Whales were likely feeding in zooplankton rich areas including the Bonney Upwelling.

Given the strandings recorded at Wilsons Promontory and the confirmed sightings of Pygmy Right Whales further west, Pygmy Right Whales may be encountered in nearshore waters.

Dusky Dolphin

The Dusky Dolphin (*Lagenorhynchus obscurus*) occurs throughout the Southern Hemisphere, mostly in temperate and sub-Antarctic zones between about 26°S and 55°S (Commonwealth of Australia 2022b). They are presumed to be primarily an inshore species; however, they may be pelagic at times (Ross 2006). Currently, Dusky Dolphins are listed as Migratory under the EPBC Act.

In Australia, Dusky Dolphin presence is known from only a very small number of records since 1828 (DEW 2007), with the Atlas of Living Australia showing only 17 records. They occur across southern Australia, from WA to Tasmania, with confirmed sightings near Kangaroo Island, SA and off Tasmania and Victoria, and unconfirmed sightings south of continental Australia (Ross 2006, Commonwealth of Australia 2022b). All sightings of Dusky Dolphins in Australian waters have been correlated with abnormally warm sea surface temperatures (more than 0.5 °C above normal temperature) (Gill et al. 2000). Dusky Dolphins are resident inshore for much of the year but are known to seek out colder water (<18 °C) as inshore temperatures rise in summer (Ross 2006). Seasonal distribution of Dusky Dolphins may also coincide with El Niño Southern Oscillation (ENSO) events which expand the extent of cold waters (Gill et al. 2000).

Given the lack of understanding of the species' distribution in Australian waters, no key localities have yet been identified (Bannister et al. 1996). Mating and calving are presumed to occur in summer, although no calving areas are known in Australian waters; however, a female stranded in Tasmania while giving birth (Gill et al. 2000, Ross 2006). Ross (2006) report that Dusky Dolphins have been seen with Southern Right Whales.

The extent of occurrence and areas of occupancy of Dusky Dolphins in Australian waters is unknown due to the rarity of sightings records, however given their presence across southern Australia and the possible association with Southern Right Whales, Dusky Dolphins may be encountered in the OWF Site and cable envelopes.

Killer Whale

The Killer Whale or Orca (*Orcinus orca*) is a cosmopolitan species that is most numerous in coastal waters and cooler regions where productivity is high (Commonwealth of Australia 2022c). There are no population estimates for the Killer Whale, either globally or within Australia (Commonwealth of Australia 2022c). The Killer Whale is currently listed as Migratory under the EPBC Act.

In Australia, Killer Whale sightings have been reported from all states, with concentrations reported around Tasmania (Commonwealth of Australia 2022c) and frequent sightings in South

Australia and Victoria (Ling 1991). Recent studies of the Killer Whale population in the Bremer Sub-Basin in WA have identified 140 individuals (Wellard and Erbe 2017), with whales occurring in high numbers throughout the months of January to April each year, although no dedicated effort has occurred outside of these months in the region (Wellard et al. 2016, Bouchet et al. 2018).

In Victoria, Killer Whales were sighted each year from 2015-2019, including off Portland in August 2019 (SWIFFT 2021b). Gill et al. (2015) reported six sightings, comprising 21 individual Killer Whales (mean group size 3.5 ± 2.8 whales), during aerial surveys in South Australian waters (eastern Great Australian Bight to western Bass Strait) in 2002/2003, 2003/2004, 2006/2007 and 2011/2012. Sightings occurred predominantly in March and May, with additional sightings in July and December. Killer Whales were predominantly sighted on the shelf close to the shelf break, in an average water depth of 171 ± 135 m (Gill et al. 2015). The Atlas of Living Australia includes multiple records of Killer Whales around Wilson's Promontory, as well as further east along the Gippsland coast, but none of these overlap with the OWF Site or cable envelopes.

There are no known foraging or breeding areas for Killer Whales within or adjacent to the OWF Site and cable envelopes, however given the frequent sightings of Killer Whales in state waters, and the confirmed sightings of this species in the Wilson's Promontory area, killer whales may be encountered in the Project Area.

4.6.5.3 PINNIPEDS

Two species of pinnipeds may be found in the cable envelopes (**Table 4-11**). Neither species is listed as Threatened or Migratory under the EBPC Act, but they are listed as Marine. Therefore, these two species are not MNES, but are described here for completeness, and in recognition of breeding colonies located in proximity to the Project Area or in the wider South-east Marine Region.

These two seal species are described in the subsections below.

TABLE 4-11 PINNIPED SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	EPBC Act Status	OWF Site (Cw/ith waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cw/ith waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable envelopes
Australian Fur Seal	<i>Arctocephalus pusillus</i>	Marine	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat may occur within area
Long-nosed Fur Seal	<i>Arctocephalus forsteri</i>	Marine	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area

Australian Fur Seal

The Australian Fur Seal (*Arctocephalus pusillus*) population is still recovering from the over-exploitation of the commercial sealing era (1798–1825), despite a recent conservative population estimate of 120,000 individuals (Kirkwood et al. 2010). The Australian Fur Seal is currently listed as Marine, but not Threatened or Migratory, under the EPBC Act.

There are ten established breeding colonies for the Australian Fur Seal, restricted to islands in the Bass Strait, with six occurring off the coast of Victoria and four off the coast of Tasmania (Commonwealth of Australia 2022c). The largest of the established colonies is a significant distance from the Project: Lady Julia Percy Island (25.9% of the breeding population) is more than 400 km west of the OWF Site and Seal Rocks, Phillip Island (25.5% of the breeding population), Victoria is 157km from the OWF Site, on the other side of Wilson's Promontory (Kirkwood et al. 2010). Phillip Island is home to 20,000 Australian Fur Seals, one quarter of the entire population.

The CoastKit search detected Australian Fur Seal colonies at Rag Island and White Rock, both of which are approximately 13 km west of the OWF Site. Additional Australian Fur Seal colonies adjacent to the OWF Site and cable envelopes include Kanowna Island, approximately 50 km and 92 km south-west of the OWF Site and Offshore Cable envelope respectively, West Moncoeur Island, approximately 41 km south-west of the OWF Site, and Reid Rocks, approximately 270 km south-west of the southernmost offshore point of the OWF Site (Kirkwood et al. 2010). Australian Fur Seal colonies are occupied year round, although the Australian Fur Seal has a single annual pupping period in the austral summer from late October to late December (Commonwealth of Australia 2022c), with 90% of pups born in a 3-4 week period with a peak in early December (Gibbens and Arnould 2009).

Australian Fur Seals are predominantly benthic foragers on the shallow (< 100 m) continental shelf of Bass Strait, feeding on a wide variety of prey types comprising bony fish, elasmobranchs and cephalopods (Speakman et al. 2020). Due to the mobility and foraging requirements of Australian Fur Seals, they may occur in areas up to 500 km away from a colony (Littnan and Arnould 2002). Foraging appears to peak in autumn and winter (Lyle and Willcox 2008), when males and females are building up their energy reserves for the pupping season (October-December) and females are maintaining milk reserves for their young which they continue to suckle. Lactating female Australian Fur Seals in the northern Bass Strait were found to forage exclusively within the shallow waters over the continental shelf of the Bass Strait, where water depths are around 60-80 m and sea surface temperature is 16- 16.8 °C (Arnould and Kirkwood 2008). For several months, females alternate periods of feeding at sea with shore attendance suckling their pups (Commonwealth of Australia 2022c). Biologically Important Areas have not yet been identified for Australian Fur Seals, as adequate spatial information on this species is not available (DSEWPC, 2012).

Long-nosed Fur Seal

The Long-nosed Fur Seal (*Arctocephalus forsteri*) breeds in southern Australia from NSW to WA, as well as in New Zealand and its sub-Antarctic islands (Shaughnessy et al. 2015). Long-nosed Fur Seals were subject to commercial hunting in the late 18th and early 19th century, with population numbers in Australia now estimated at around 117,400 (Chilvers and

Goldsworthy 2015). The Long-nosed Fur Seal is currently listed as Marine, but not Threatened or Migratory, under the EPBC Act.

Most of the Australian population of Long-nosed Fur Seal is in South Australia, between Kangaroo Island and the southern tip of the Eyre Peninsula (Shaughnessy et al. 2015). The highest number of breeding sites (n=12) are found on Kangaroo Island, accounting for 49.6% of the total pup abundance estimate for South Australia (Shaughnessy et al. 2015). Breeding sites in Victoria include Cape Bridgewater, Kanowna Island, and the Skerries. The closest of these to the OWF Site and cable envelopes is Kanowna Island, approximately 50 km and 92 km south-west of the OWF Site and Offshore Cable Envelope respectively (Kirkwood et al. 20010). Breeding takes place between October and January, with pups born from mid-November, and most born in December (Chilvers and Goldsworthy 2015).

Long-nosed Fur Seals are considered non-migratory. Satellite tracking studies in SA found adult females forage in mid-outer shelf waters in regions associated with localised upwelling (Bonney Upwelling) approximately 70-90 km from breeding colonies in December to March, switching to foraging in distant oceanic waters associated with the sub-tropical front, approximately 700-1,000 km south of breeding colonies between April/May to September/October (Baylis et al. 2008). Satellite tracking studies of juvenile Long-nosed Fur Seal from Kangaroo Island showed that they typically forage in pelagic waters ~1,000 km further south in association with the sub-tropical front (Shaughnessy and Goldsworthy 2020).

Given the proximity of the OWF Site and Offshore Cable Envelope to Kanowna Island to the south-west, Long-nosed Fur Seals may be encountered in the Project Area.

4.6.5.4 MARINE TURTLES

The desktop review (**Appendix A**) identified three EPBC-listed Threatened and Migratory marine turtles that may potentially occur within the OWF Site and cable envelopes (**Table 4-12**).

The turtle species identified are seasonal or infrequent visitors in the Bass Strait; Leatherback Turtles have a more temperate distribution than the Loggerhead and Green Turtles and have been sighted along most of the coastline (Department of Sustainability and Environment, 2009). It is therefore likely that turtles encountered in the area will be Leatherback Turtles. Green Turtles and Loggerhead turtles are uncommon in waters off Victoria (Commonwealth of Australia, 2017).

There no turtle BIAs or Habitat Critical to the Survival of Marine Turtles in the OWF Site or cable envelopes. However, the northern Bass Strait is a significant feeding ground for Leatherback Turtles and has been identified as one of the three largest concentrations of feeding Leatherback Turtles in Australia, with the other two locations being northern and central NSW, and the eastern Great Australian Bight (Department of Sustainability and Environment, 2009). Most sightings occur between January and May (Department of Sustainability and Environment, 2009).

Marine turtles are affected by several human activities, including entanglement in marine debris, interactions with fishing equipment and disturbed nesting sites. Marine noise, which will be generated during the project, could potentially affect marine turtles in the area. Although the precise effects of marine noise disturbance on turtles is unknown, alarm responses have

been reported for turtles in marine seismic survey areas (Department of Sustainability and Environment, 2009).

TABLE 4-12 EPBC ACT-LISTED THREATENED AND MIGRATORY TURTLE SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Loggerhead Turtle	<i>Caretta caretta</i>	Endangered, Migratory	✓	Species or species habitat known to occur within area	✓	✓	Breeding likely to occur within area
Leatherback Turtle	<i>Dermochelys coriacea</i>	Endangered, Migratory	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area
Green Turtle	<i>Chelonia mydas</i>	Vulnerable, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area

4.6.5.5 FISH

The desktop review (**Appendix A**) identified the potential occurrence of two Threatened and Migratory fish species, one Threatened but not Migratory fish species, and two Migratory but not Threatened fish species (**Table 4-13**). Two fish species are also listed as Conservation Dependent under the EPBC Act, although Conservation Dependent species are not MNES.

The OWF Site and cable envelopes overlap with several foraging BIAs for the Vulnerable White Shark (**Table 4-14**). The Recovery Plan states that threats include ecosystem effects as a result of habitat modification, and that critical habitats (i.e., BIAs) should be protected to minimise impact on survivorship.

Australian Grayling

The Australian Grayling (*Prototroctes maraena*) is listed as Vulnerable under the EPBC Act. This species is distributed along the east Australian coast, from the South-Australian border to Sydney cove, and around King Island and Tasmania (Commonwealth of Australia, 2022e).

In Victoria during the 1980s, this species had been most frequently collected in the Tambo, Barwon, Mitchell and Tarwin River systems (Jackson and Koehn 1988). There are no reliable current population estimates for the Australian Grayling; the species is reported to now be relatively uncommon and is often only caught in small numbers (less than 10).

This fish migrates between freshwater streams and brackish coastal lagoons and coastal waters. Adult fish undertake spawning migrations to the lower reaches of rivers between February and May. Spawning occurs in April – May and the newly-hatched larvae drift downstream and out into coastal waters, where they remain for approximately six months before juveniles migrate back into fresh water (Backhouse et al. 2008; Amtstaetter et al. 2015).

Blue Warehou

The Blue Warehou, *Seriola lalandi*, is listed as Conservation Dependant under the EPBC Act. There is no approved conservation advice, Recovery Plan, or Threat Abatement Plan for this species (DoECommonwealth of Australia, 2022f).

This species may occur along the coast from Brisbane to Esperance, throughout the Bass Strait and around Tasmanian coasts (DoECommonwealth of Australia, 2022f). It is targeted within Commonwealth and state-managed fisheries and has been Threatened by overfishing (Threatened Species Scientific Committee, 2015).

White Shark

The White Shark, *Carcharodon carcharias*, is a migratory species listed as Vulnerable under the EPBC Act. There is no approved conservation advice, Recovery Plan, or Threat Abatement Plan for this species (Commonwealth of Australia, 2022h).

The White Shark is widely, but sparsely, found in all seas including cold temperate waters in both hemispheres. In Australia, White Sharks have been recorded from central Queensland around the south coast to north-west Western Australia but may occur further north on both coasts. It has been sighted in all coastal areas except in the Northern Territory. Although capable of crossing ocean basins, the species is typically found from close inshore habitats

(e.g., rocky reefs and shallow coastal bays) to the outer continental shelf and slope areas. Within Australian waters, the majority of recorded great white shark movements occur between the coast and the 100-metre depth contour. Both adults and juveniles have been recorded diving to depths of 1000 metres (Commonwealth of Australia, 2022h).

The main threats faced by white sharks in Australian waters are from interactions with commercial and recreational fisheries and shark control programs.

The OWF Site and cable envelopes overlap with four BIAs for this species (**Figure 4-11**). Notably, both the Nearshore and Offshore Cable Envelopes sit entirely within a Breeding BIA (nursery area) located off Lakes Entrance and extending to the east coast of Wilson's Promontory. A small portion of the OWF Site also overlaps the nursery BIA. A number of foraging BIAs are defined throughout the Bass Strait surrounding fur seal and sea lion colonies, including the fur seal colony at Phillip Island.

Porbeagle

The Porbeagle, *Lamna nasus*, is listed as a Migratory species under the EPBC Act. There is no approved conservation advice, Recovery Plan, or Threat Abatement Plan for this species (Commonwealth of Australia, 2022i).

This species has a worldwide distribution, primarily in temperate waters. The Porbeagle primarily inhabits oceanic waters and areas around the edge of the continental shelf. They occasionally move into coastal waters, but these movements are temporary (Francis et al. 2002) and it is thought to be reasonably flexible in the types of habitat used for foraging (Pade et al. 2009).

The Porbeagle is known to be particularly vulnerable to overfishing due to its slow growth rate, late age at maturation and low fecundity (Commonwealth of Australia, 2022i).

Eastern School Shark

The School Shark, *Galeorhinus galeus*, is listed as Conservation Dependant under the EPBC Act. There is no approved conservation advice, Recovery Plan, or Threat Abatement Plan for this species (Commonwealth of Australia, 2022j).

Whilst this species may occur throughout the Bass Strait, it is likely to be found in the western regions of Bass Strait which lie far outside the OWF Site and cable envelopes (Commonwealth of Australia, 2022j). This shark is targeted in several commercial fisheries.

Shortfin Mako

The Shortfin Mako, *Isurus oxyrinchus*, is listed as Migratory under the EPBC Act. In Australia, there is no approved conservation advice, Recovery Plan, or Threat Abatement Plan for this species (Commonwealth of Australia, 2022k).

This species has a global distribution and is likely to occur in all Australian waters except those of the Northern Territory (Commonwealth of Australia, 2022k). Overfishing poses the greatest threat to this species, and it is harvested globally using several fishing methods (IUCN, 2022).

Whale shark

The whale shark, *Rhincodon typus*, is listed as Vulnerable and Migratory under the EPBC Act. In Australia, conservation advice has been in effect for this species since 2015 (TSSC, 2015b),

however there is no Recovery Plan, or Threat Abatement Plan for this species (Commonwealth of Australia, 2022l).

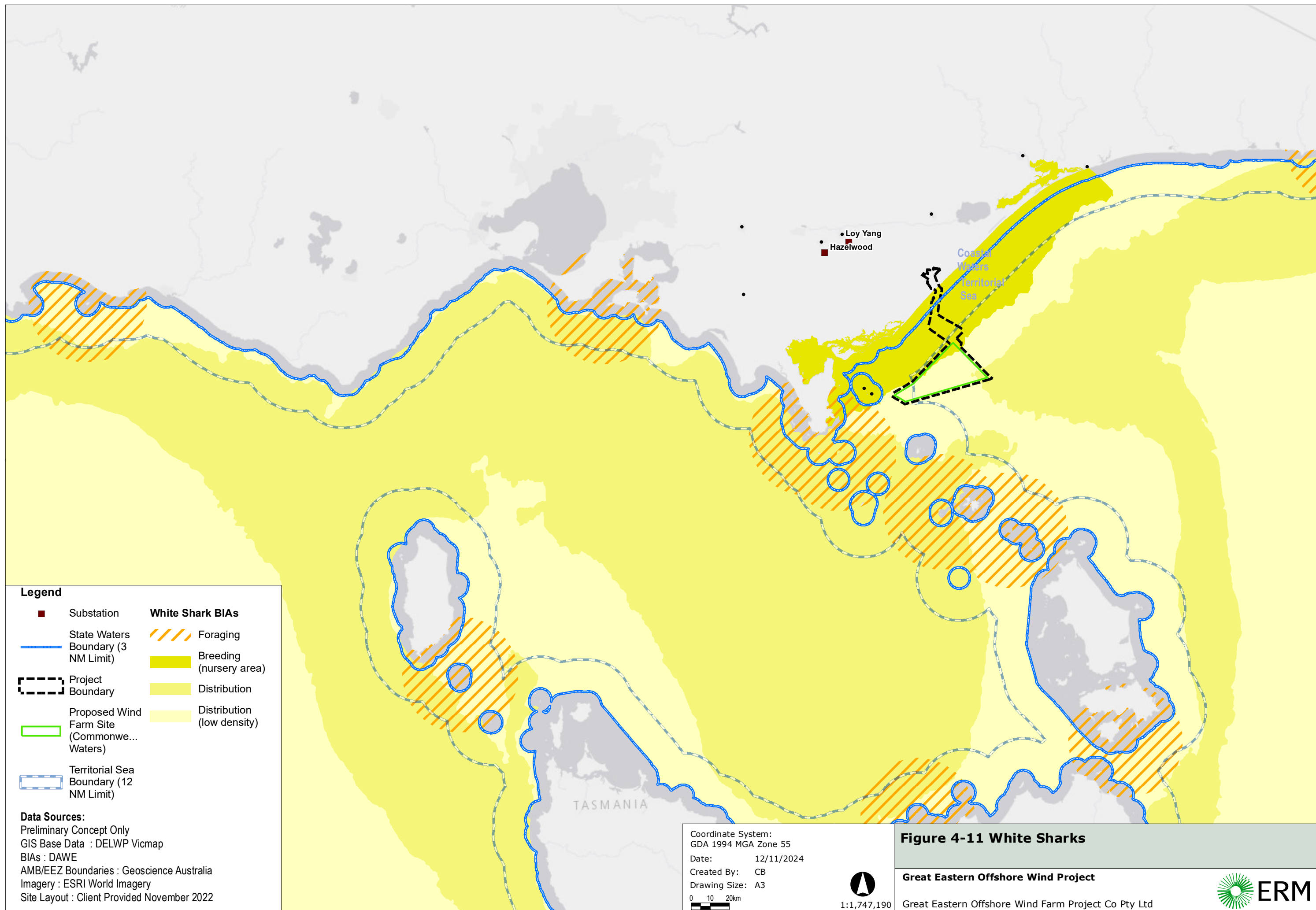
This species is predominantly found in the northern waters of Western Australia but may also be found along the northern and eastern coasts of Australia. In Victoria, whale sharks may occur along the eastern border, from the NSW boundary to Woodside Beach. The OWF Site and cable envelopes are located in the whale shark's southernmost distribution. The species is unlikely to occur/may occur infrequently in these waters.

TABLE 4-13 EPBC ACT-LISTED FISH SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	EPBC Act Threatened / Migratory Status	OWF Site (Cw/wh waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cw/wh waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Australian Grayling	<i>Prototroctes maraena</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Blue Warehou	<i>Serirolella brama</i>	N/A – Conservation Dependent	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area
White Shark	<i>Carcharodon carcharias</i>	Vulnerable, Migratory	✓	Breeding known to occur within area	✓	✓	Breeding known to occur within area
Porbeagle	<i>Lamna nasus</i>	Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Eastern School Shark	<i>Galeorhinus galeus</i>	N/A – Conservation Dependent	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Shortfin Mako	<i>Isurus oxyrinchus</i>	Migratory	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Whale Shark	<i>Rhincodon typus</i>	Vulnerable, Migratory	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area

TABLE 4-14 SHARK BIA'S WITHIN THE OWF SITE AND CABLE ENVELOPE

Species	BIA	Location	Presence	Distance and Direction from the OWF Site	Distance and Direction from Cable Envelopes
White Shark	Breeding (nursery area)	From the eastern coast of Wilsons Promontory to Lakes Entrance	Known to occur	Overlap	Overlap with both cable envelopes
White Shark	Distribution	Between to 60-129m depth contour	Known to occur	Overlap (a small fragment of the north-east corner)	15 km south-east of OCE
White Shark	Distribution (low density)	Australian waters from Barrow Island/Montebello Islands, WA to Yeppoon/Swains Reef, QLD	Likely to occur	Overlap	Overlaps OCE, directly adjacent to NCE
White Shark	Known distribution	Coastal/Shelf/Upper Slope waters out to 1,000 m depth contour	Known to occur	Overlap	Overlap with both cable envelopes



4.7 STATE BIODIVERSITY VALUES

The following sub-sections provide a summary of additional state biodiversity values relevant to the Project.

4.7.1 NATIVE VEGETATION

Native vegetation in Victoria is defined by the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017) and in Victoria Planning Provisions as '*plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses*'. Based on this definition, seagrass and algae may potentially be considered native vegetation and is present in coastal waters in the Nearshore Cable Envelope. Areas of seagrass and algae are described in **Section 4.3** (benthic habitats and communities).

EVCs are a unit for classifying vegetation communities in Victoria. EVC benchmarks have been developed in Victoria to assess areas of native vegetation in comparison to a 'benchmark' condition, and these underpin the assessment of native vegetation removal in Victoria. EVCs have been defined for terrestrial and some coastal tidal environments but do not extend into "exclusively marine" environments. No EVCs occur within the Nearshore Cable Envelope, however, the following three coastal EVCs are noted as occurring in areas adjacent to the Nearshore Cable Envelope:

- Coastal Saltmarsh;
- Coastal Dune Scrub/Coastal Dune Grassland Mosaic; and
- Estuarine Wetland.

Given the proximity of these EVCs to the Nearshore Cable Envelope and because coastal saltmarsh and estuarine wetland ecology is dependent upon regular or intermittent tidal influence, they have been considered in this report in terms of potential impacts from marine components of the Project. Both coastal saltmarsh areas and estuarine wetland areas are recognised in protected important wetlands, as described in **Section 4.5.3**.

Generally, however, potential impacts on EVCs are considered to be associated with terrestrial components of the Project and are described and assessed in the GEOW Preliminary Terrestrial Ecology Report (ERM, 2023a).

4.7.2 THREATENED ECOLOGICAL COMMUNITIES

Threatened Communities are protected under the FFG Act. With the exception of one marine community, TECs listed under the FFG Act are all terrestrial communities. There are currently no databases or publicly available maps of FFG Act-listed TECs, making it difficult to determine the presence of these communities within the Project Area.

In the absence of a database, the Scientific Advisory Committee's description of the distribution of Threatened Communities (DELWP, n.d.(c)) was used to identify those which may occur within the OWF Site and cable envelopes. No FFG Act-listed TECs were identified in the OWF Site or cable envelopes based on the Scientific Advisory Committee's TEC distribution descriptions.

4.7.3 THREATENED SPECIES

Fifty FFG Act-listed Threatened species have been identified from both the VBA and the PMST searches (**Appendix A**). **Section 4.7.3.1** to **Section 4.6.5.5** identify the FFG Act-listed Threatened species that potentially occur within the OWF Site and cable envelopes.

4.7.3.1 BIRDS

Table 4-16 lists the 42 FFG Act-listed Threatened seabird (16), shorebird (23) and migratory land bird (4) species identified as potentially occurring within the OWF Site and cable envelopes.

CoastKit identifies Seal Island, Notch Island, Rag Island and Clifty Island (located in state waters between approximately 12 km and 14 km west of the OWF Site) as being rookeries for Fairy Prion (*Pachyptila turtur*), Short-tailed Shearwater (*Ardenna tenuirostris*), Crested Tern (*Thalasseus bergii*), Little Penguin (*Eudyptula minor*), Common Diving Petrel (*Pelecanoides urinatrix*), Black Faced Cormorant (*Phalacrocorax fuscescens*), Pacific Gull (*Larus pacificus*) and Silver Gull (*Chroicocephalus novaehollandiae*). None of these seabird species are listed as Threatened under the FFG Act but the rookeries are noted for their proximity to the OWF Site.

4.7.3.2 CETACEANS

Table 4-17 lists the 3 FFG Act-listed Threatened cetacean species identified as potentially occurring within the OWF Site and cable envelopes. These species have been described previously in **Section 4.6.5.2**.

4.7.3.3 PINNIPEDS

Table 4-18 lists the FFG Act-listed Threatened pinniped species potentially occurring within the OWF Site and cable envelopes. In addition to the Long-nosed Fur Seal, Australian Fur Seals (not FFG Act-listed Threatened) are also expected to occur in the Project Area and breeding colonies are located at Rag Island and White Rock, approximately 13 km west of the OWF Site. Both species have been described previously in **Section 4.6.5.3**.

4.7.3.4 MARINE TURTLES

Table 4-19 lists the FFG Act-listed Threatened turtle species potentially occurring within the OWF Site and cable envelopes. This is limited only to the Leatherback Turtle, which is known to forage in the Bass Strait, as described previously in **Section 4.6.5.4**.

4.7.3.5 FISH

Table 4-20 lists the 3 FFG Act-listed Threatened fish species potentially occurring within the OWF Site and cable envelopes. These species have been described previously in **Section 4.6.5.5**.

TABLE 4-15 FFG ACT-LISTED THREATENED BIRD SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	FFG Act status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Seabirds							
Shy Albatross	<i>Thalassarche cauta</i>	Endangered	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Grey-headed Albatross	<i>Thalassarche chrysostoma</i>	Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Southern Royal Albatross	<i>Diomedea epomophora</i>	Critically Endangered	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Wandering Albatross	<i>Diomedea exulans</i>	Critically Endangered	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Sooty Albatross	<i>Phoebastria fusca</i>	Critically Endangered	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat may occur within area
Buller's Albatross	<i>Thalassarche bulleri</i>	Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>	Endangered	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Southern Giant-Petrel	<i>Macronectes giganteus</i>	Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area
Northern Giant Petrel	<i>Macronectes halli</i>	Endangered	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area

Common Name	Scientific Name	FFG Act status	OWF Site (Cw/with waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cw/with waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
White-faced Storm-Petrel	<i>Pelagodroma marina</i>	Endangered	✓	Foraging known to occur within area	X	X	N/A
Little Tern	<i>Sternula albifrons</i>	Critically Endangered	X	N/A	✓	✓	Species or species habitat may occur within area
Australian Fairy Tern	<i>Sternula nereis nereis</i>	Critically Endangered	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Species or species habitat known to occur within area
Australian Gull-billed Tern	<i>Gelochelidon macrotarsa</i>	Endangered	✓***	N/A	X	X	N/A
White-faced Storm-Petrel	<i>Pelagodroma marina</i>	Endangered	✓***	N/A	X	X	N/A
Caspian Tern	<i>Hydroprogne caspia</i>	Vulnerable	✓***	N/A	X	X	N/A
Black-browed Albatross	<i>Thalassarche melanophris</i>	Vulnerable	✓	Foraging, feeding or related behaviour likely to occur within area	✓	✓	Foraging, feeding or related behaviour likely to occur within area
Shorebirds							
Curlew Sandpiper	<i>Calidris ferruginea</i>	Critically Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Far Eastern Curlew	<i>Numenius madagascariensis</i>	Critically Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Red Knot	<i>Calidris canutus</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area

Common Name	Scientific Name	FFG Act status	OWF Site (Cw/with waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cw/with waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Australian Painted Snipe	<i>Rostratula australis</i>	Critically Endangered	X	N/A	✓	✓	Species or species habitat likely to occur within area
Greater Sand Plover	<i>Charadrius leschenaultii</i>	Vulnerable	X	N/A	✓	✓	Species or species habitat likely to occur within area
Common Sandpiper	<i>Actitis hypoleucos</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Little Egret	<i>Egretta garzetta</i>	Endangered	✓***	N/A	✓***	✓***	N/A
Plumed Egret	<i>Ardea intermedia plumifera</i>	Critically Endangered	✓***	N/A	X	X	N/A
Hooded Plover	<i>Thinornis cucullatus</i>	Vulnerable	X	N/A	✓	✓	Species or species habitat likely to occur.
Lesser Sand Plover	<i>Charadrius mongolus</i>	Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area
Ruddy Turnstone	<i>Arenaria interpres</i>	Endangered	✓***	N/A	✓***	✓***	N/A
Whimbrel	<i>Numenius phaeopus</i>	Endangered	✓***	N/A	X	X	N/A
Bar-tailed Godwit	<i>Limosa lapponica</i>	Vulnerable	X	N/A	✓	✓	Species or species habitat known to occur within area
Pacific Golden Plover	<i>Pluvialis fulva</i>	Vulnerable	X	N/A	✓	✓	Species or species habitat known to occur within area

Common Name	Scientific Name	FFG Act status	OWF Site (Cw/with waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cw/with waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Common Greenshank	<i>Tringa nebularia</i>	Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area
Marsh Sandpiper	<i>Tringa stagnatilis</i>	Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Latham's Snipe	<i>Gallinago hardwickii</i>	Vulnerable	✓***	N/A	✓	✓	Species or species habitat likely to occur within area
Australasian Shoveler	<i>Spatula rhynchotis</i>	Vulnerable	X	N/A	✓***	✓***	N/A
Musk Duck	<i>Biziura lobate</i>	Vulnerable	X	N/A	✓***	✓***	N/A
Grey Goshawk	<i>Accipiter novaehollandiae</i>	Endangered	✓***	N/A	X	X	N/A
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Endangered	✓***	N/A	X	X	N/A
Migratory Land Birds							
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	Critically Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area
Swift Parrot	<i>Lathamus discolor</i>	Critically Endangered	X	N/A	✓	✓	Species or species habitat known to occur within area

Common Name	Scientific Name	FFG Act status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
White-throated Needletail	<i>Hirundapus caudacutus</i>	Vulnerable	X	N/A	✓	✓	Species or species habitat known to occur within area

* Species not identified in PMST or VBA search results, but included on the basis that a BIA overlaps with the Project Area.

** Species not identified in PMST or VBA search results, but included on the basis that a breeding colony is within 15 km of the Project Area.

*** Detected in VBA results but not in the PMST results

TABLE 4-16 FFG ACT-LISTED THREATENED CETACEAN SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	FFG Act status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Blue Whale	<i>Balaenoptera musculus</i>	Endangered	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area
Southern Right Whale	<i>Eubalaena australis</i>	Endangered	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area
Humpback Whale	<i>Megaptera novaeangliae</i>	Critically Endangered	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area

TABLE 4-17 FFG ACT-LISTED PINNIPED SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	FFG Act Status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Long-nosed Fur Seal	<i>Arctocephalus forsteri</i>	Vulnerable	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat may occur within area

TABLE 4-18 FFG ACT-LISTED THREATENED TURTLE SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	FFG Act status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
Leatherback Turtle	<i>Dermochelys coriacea</i>	Critically Endangered	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area

TABLE 4-19 FFG ACT-LISTED FISH SPECIES PREDICTED TO OCCUR WITHIN THE OWF SITE AND CABLE ENVELOPES

Common Name	Scientific Name	FFG Act status	OWF Site (Cwlth waters)	PMST Presence Assessment: OWF Site	Offshore Cable Envelope (Cwlth waters)	Nearshore Cable Envelope (State waters)	PMST Presence Assessment: Cable Envelopes
White Shark	<i>Carcharodon carcharias</i>	Endangered	✓	Breeding known to occur within area	✓	✓	Breeding known to occur within area
Australian Grayling	<i>Prototroctes maraena</i>	Endangered	✓	Species or species habitat may occur within area	✓	✓	Species or species habitat known to occur within area
Blue Warehou	<i>Seriola lalandi</i>	N/A – Conservation Dependent	✓	Species or species habitat known to occur within area	✓	✓	Species or species habitat known to occur within area
Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	N/A – Conservation Dependent	✓	Species or species habitat likely to occur within area	✓	✓	Species or species habitat likely to occur within area

4.8 SOCIO-ECONOMIC ENVIRONMENT

The following subsections describe the coastal communities and marine socio-economic activities relevant to the offshore Project Area and surrounding region. Landscape and visual impacts are considered in the Preliminary Visual Appraisal (Hansen Partnership, 2023).

4.8.1 COASTAL COMMUNITIES

A number of communities are situated along coastline that overlooks the OWF Site (**Figure 1-1**). Although these are not located within the offshore Project Area boundary, they are relevant to the assessment of potential indirect impacts on communities in the state jurisdiction.

The main coastal settlement adjacent to the offshore Project Area is Woodside Beach. The population of Woodside Beach in 2021 was 114 based on Australian Bureau of Statistics 2021 census data. Settlements along the coast to the north-east of the Project Area and within 50 km of the OWF Site include Seaspray (population 373), The Honeysuckles (population 131), Glomar Beach (population 21) and Flamingo Beach (low population / no population data available). Coastal settlements within Corner Inlet and its adjoining channels to the west of the Project Area and within 50 km of the OWF Site include Port Welshpool (population 220), Port Albert (population 403), Robertsons Beach (population 49), Manns Beach (population 29) and McLoughlins Beach (population 121).

4.8.2 COMMERCIAL FISHERIES

A review of fishing effort data was undertaken for Commonwealth and state-managed fisheries to ascertain which fisheries are most likely to be active within the OWF Site and the cable envelopes. Fisheries and fishing effort data is provided in **Appendix B**. Key relevant fisheries are described below.

Initial consultation has also been undertaken by Corio with the AFMA, the VFA, SETFIA, SSIA, and CFA. Further consultation is planned with Commonwealth and state commercial fisheries agencies, industry associations and other stakeholders to better understand their activities and explore opportunities for coexistence.

Corio have undertaken detailed analysis to understand their impacts on the commercial fishing industry and have shared this with SSIA and SETFIA. These associations subsequently provided the following feedback; 'GEOW has generally low impacts and neither SSIA nor SETFIA have any site-specific concerns.'

Commonwealth-Managed Fisheries

Fishing data obtained from ABARES for the period 2003-2022 indicate the following Commonwealth-managed fisheries have been active at some level in the vicinity of the OWF Site and the cable envelopes:

- Southern and Eastern Scalefish and Shark Fishery (SESSF) – Commonwealth Trawl Sector – Danish Seine Sub-sector;
- SESSF – Commonwealth Trawl Sector – Otterboard Trawl Sub-sector;
- SESSF – Shark Gillnet Sub-sector;
- SESSF – Shark Hook Sub-sector; and

- Southern Squid Jig Fishery.

In many cases, reported fishing effort for the OWF Site and cable envelopes has involved fewer than 5 vessels per year per 60 nm block and no further information is available. Where more than 5 vessels have fished in a year, more detailed fishing intensity data is available. Mapped fishing intensity suggests that the two key Commonwealth-managed fisheries relevant to the Project are likely to be:

- SESSF – Shark Gillnet Sub-sector; and
- SESSF – Commonwealth Trawl Sector – Danish Seine Sub-sector.

These fisheries are summarised further below.

SESSF – Shark Gillnet Sub-sector

The Shark Gillnet Sub-sector of SESSF extends south from the New South Wales – Victoria border, around Tasmania, and west to the South Australia – Western Australia border. The fishery targets gummy shark, school shark and elephantfish.

Most of the fishing occurs in waters adjacent to the coastline and throughout the Bass Strait, with recent spatial closures concentrating effort off Victoria.

Fishing effort data for 2018-2022 indicates that:

- The OWF Site overlaps with an area of 'high' fishing intensity.
- The Offshore Cable Envelope overlaps with a small area of 'high' fishing intensity, and a large portion of 'medium' fishing intensity.
- The Nearshore Cable Envelope overlaps with an area of 'low' fishing intensity.

This overlap represents a very small portion of the sub-sector's total fishing grounds, which occur throughout the Bass Strait and the wider region. High fishing intensity also occurs to the east of the OWF Site, across the eastern coast and extending southwards to Tasmania, and off the north-east coast of Tasmania. Areas of 'medium' fishing intensity occur throughout the deeper waters of Bass Strait. Fisheries data showed 43 different demersal gillnet and demersal longline vessels reported 864 shots that caught 197.3 t of fish in the OWF Site from 2003-2022, with 6-15 vessels fishing and reporting of 18-76 shots in any one year (Atlantis 2023). The main species caught were Gummy Shark (80.5%), Common Sawshark (5.9%), Elephantfish (4.7%), Southern Sawshark (2.5%) and Boarfishes (1.0%) (Atlantis 2023).

SESSF – Commonwealth Trawl Sector – Danish Seine Sub-sector

The Commonwealth Trawl Sector of the SESSF extends south from Fraser Island off Queensland to east of Kangaroo Island off South Australia. This fishery targets several fish and shark species; the main species landed in 2019-20 included Blue grenadier, Flathead, Orange roughy, Pink ling and Eastern school whiting.

Fishing effort data for 2018-2022 indicates that the OWF Site and the cable envelopes overlap with an area of low fishing intensity. This overlap represents a small portion of Danish Seine sub-sector fishing grounds: the majority of the fishing grounds and the fishing effort occur to the east of the OWF Site and cable envelopes, around Lakes Entrance and southern NSW. Consultation with SETFIA indicated that trawl effort within the OWF Site and cable envelopes is likely to be limited and the mapped area of low fishing intensity that overlaps with the proposed Project is likely to be an artefact of the coarse data resolution and processing.

Fisheries data for 2003-2022 showed 12 different vessels (Danish seine and otter trawl) undertook 230 shots that caught 32.6 t of fish in the OWF Site. Catch composition for the OWF Site and annual catch and effort data was not available due to confidentiality rules.

State-Managed Fisheries

Fisheries data for 2003-2022 showed eight different Victorian managed fisheries reported effort from reporting grids that overlapped with the OWF Site: Commercial Permit, Octopus Fishery, Ocean (General Fishery), Octopus Permit, Ocean Scallop, Rock Lobster Fishery and the Trawl (Inshore) Fishery (Atlantis 2023). These fisheries used the following fishing gears: fish trawl, handline, meshnet, octopus trap, purse seine, rock lobster trap, scallop dredge, snapper longline and unknown (Atlantis 2023).

A total of 85.1 t of fish was landed from this area, with main species caught being Commercial Scallop (31.6 t, 7 vessels, 30 days, 7 fishers), Australian Salmon (confidential, 1 vessel, 1 day, 1 fishers), Octopus (confidential, 1 vessel, 1 day, 1 fishers), Pale Octopus (confidential, 3 vessel, 5 day, 2 fishers), Australian Sardine (confidential, 1 vessels, 2 days, 1 fishers) and Snapper (confidential, 3 vessels, 17 days, 3 fishers) (Atlantis 2023).

Fishing data obtained from the VFA for 2016-2020 show that three Victorian state fisheries operated to some limited extent within the OWF Site or cable envelopes during this period. However, the data shows that the fishing effort of these fisheries was relatively low (<30 days fishing effort during the 2016 – 2020 period). State fisheries effort relative to the OWF Site and cable envelopes is summarised as follows:

- Rock Lobster Fishery (Eastern Zone): Fishing effort data (2016-2020) indicates that the north-eastern boundary of the OWF Site, and most of the cable envelopes, overlap with areas of low fishing effort (1-30 days). The data show that the Western Zone of the fishery has historically been more productive than the Eastern Zone.
- Inshore Trawl Fishery: Fishing effort data (2016-2020) indicates that the cable envelopes overlap with an area of low fishing effort (1-30 days). The most intense fishing effort was located approximately 90 km north-east of the cable envelopes, around Lakes Entrance.
- Multi-species Ocean Fishery and Octopus Fishery: The Multi-species Ocean Fishery and Octopus Fishery are two separate licenced fisheries but effort data for the two fisheries is combined under 'Ocean General, Commercial Permit and Octopus'. The OWF Site and cable envelopes overlap with an area of low fishing effort (1-30 days).
- Ocean Wrasse Fishery: The fishery did not fish in the OWF Site or cable envelopes during the 2016 – 2020 period, although the south-west corner of the OWF Site and cable envelopes are adjacent to an area of low fishing effort (1-30 days). Fishing effort is greater in waters to the west of Wilson's Promontory.
- Ocean Scallop Fishery: The fishery is characterised by highly variable catches due to fluctuations in the resource (VFA 2021d). Whilst no fishing effort (2016-2020) was recorded in the OWF Site, areas of low fishing effort (1-30 days) are located at the eastern and western boundaries of the cable envelopes, where established scallop beds are understood to occur.

4.8.3 WATER BODIES USED FOR BENEFICIAL PURPOSES

The Nearshore Cable Envelope is located within the Open Coast marine segment (subsegment *Gippsland (Two-Fold)*) of Victoria's surface waters for the purpose of Victoria's Environment Reference Standard (ERS). The relevant environmental values for this segment are outlined in Table 5.6 of the ERS and include: water dependent ecosystems (largely unmodified), navigation and shipping, aquatic foods for human consumption, Traditional Owner cultural values and water-based recreation.

4.8.4 AQUACULTURE

The CoastKit search identified that there are no aquaculture licences in the OWF Site and cable envelopes. Further information about aquaculture licences and activities at this site could not be found. Further investigation will be conducted as part of the Project's stakeholder consultation process.

4.8.5 SHIPPING AND NAVIGATION

There are a range of different types of marine vessels that may either be present in the vicinity of the OWF undertaking commercial or recreational activities or transiting through the area.

There are no large commercial ports in the vicinity of the OWF Site. Local ports support commercial fishing and offshore industry vessels in Victoria that are managed separately to the commercial trading ports. Recreational craft and tourism adventure businesses (fishing, diving, ecotourism) also operate in the region with smaller vessels than commercial trading vessels.

Key local ports are:

- Port of Corner Inlet and Port Albert caters for amateur and professional fishermen, leisure boating, charter vessels and larger commercial vessels. The Port is located 34 km north-west of the OWF Site. The port supports roll-on/roll-off cargo vessels that operate between Tasmania and Gippsland region. The Port also hosts the Port Anthony and the Exxon Mobil Barry Beach marine terminals which support the Bass Strait oil and gas fields;
- Port of Gippsland Lakes is located 113 km north-east of the OWF Site. The port caters for amateur and professional fishermen, tourism activities, leisure boating, and charter vessels. The port covers an area of 420 km² and safe access to Bass Strait is maintained via a man-made ocean access at Lakes Entrance; and
- Port of Anderson Inlet is located 102 km north-west of the OWF Site at Inverloch. The port caters for amateur and professional fishing vessels, tourism activities, and leisure boating. Access for vessels can be restricted in areas due to tidal influences.

Corio has undertaken initial consultation with the Australian Maritime Safety Authority (AMSA), and guidance relevant to shipping and navigation specific to offshore wind projects is in development.

Commercial vessel transit

Commercial trading vessels use Bass Strait as a route between major and minor ports on the Australian coast. Key ports that require vessels to transit Bass Strait are Port Melbourne, Geelong Port and the Port of Hastings in Westernport Bay.

Western Port is the largest local port in the vicinity. It is located approximately 150 km to the north-west of the OWF Site. A Defence base and minor port is located within Western Port at HMAS Cerberus. Any Defence vessels may enter Western Port for operations and training. The Port of Hastings is the major hub supporting the Gippsland/Bass strait oil fields, supporting crude oil and LPG tankers of up to 100,000 tonnes. The port is also an import port for liquid transport fuels and steel. The port also supports the regional fishing industry.

The Port of Melbourne is located in the heart of Melbourne, approximately 200 km north-west of the OWF Site. The port is Australia's largest capital city container and general cargo port, handling more than one-third of the nation's container trade. Throughput is approximately 2.88 million containers annually. Melbourne also hosts other cargo facilities including fuels, cement and gypsum, and it is the major sea link hub connecting to Tasmania. The Port of Melbourne serves as a vital freight hub for Australia, including connections with southern New South Wales, South Australia and Tasmania. The port handles \$110 billion in trade and supports 9,200 local jobs, benefitting the Victorian economy to the tune of \$6 billion annually.

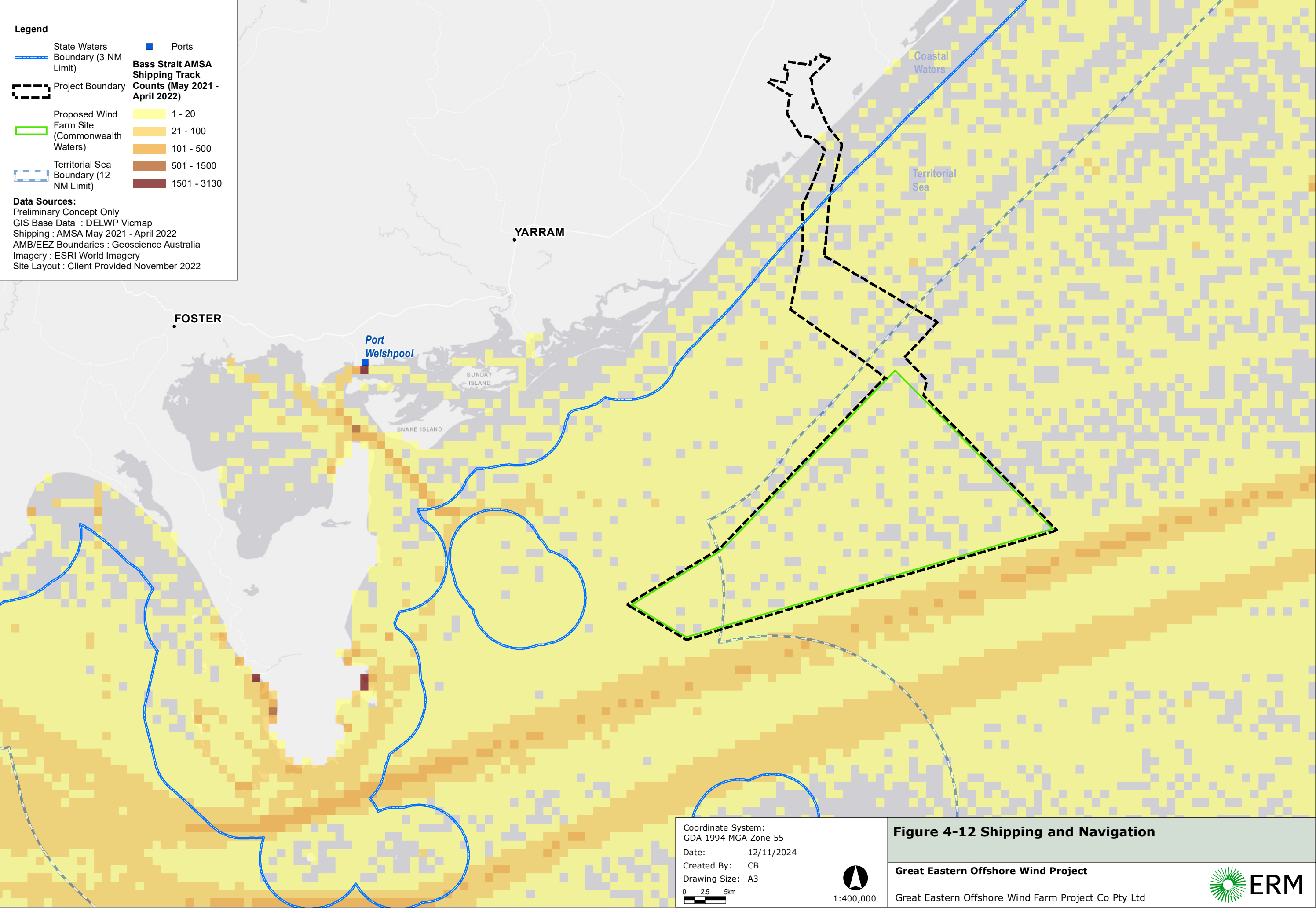
Geelong Port is Victoria's premier bulk cargo port, located in the western reaches of Port Phillip Bay, approximately 230 km north-west of the OWF Site. It is Victoria's second largest port, handling 12 million tonnes of cargo and more than 600 vessel visits each year. It is considered a major contributor to the Victorian economy, managing \$7 billion in trade and supporting 1,800 regional jobs.

The Victorian government CoastKit tool was used to identify navigation equipment in and adjacent to the OWF Site and cable envelopes. The CoastKit search identified no navigation equipment within the OWF Site or cable envelopes.

AMSA provides publicly available vessel Automatic Information System (AIS) tracking data which shows that some vessel traffic occurs within the OWF Site and the cable envelopes (**Figure 4-12**). The OWF Site and the cable envelopes contained fewer than 20 vessels transits between May 2021 and April 2022. Higher vessel movements, associated with the Bass Strait transit route for commercial vessels, occurs along the southern border of the OWF Site in Commonwealth waters; this was predominantly 21-100 vessel transits, although 101-500 vessel transits occurred in some patches.

There is a Traffic Separation Scheme extant for vessels transiting past Wilsons Promontory, and the inshore westbound route is approximately 20 km west-south-west of the OWF site. Another Traffic Separation Scheme serves for vessels transiting to the south of the petroleum 'Area to be Avoided' (refer to **Section 4.7.12.10**), and this Traffic Separation Scheme is located approximately 75 km east-north-east of the OWF Site. Vessel AIS data shows the commercial trading vessel traffic between these two Traffic Separation Schemes follow a west-south-west / east-north-east direction and transits approximately 4-15 km to the south of the OWF Site.

Significant local vessel traffic was also identified that has accessed Bass Strait waters roughly parallel to Ninety Mile Beach. These vessels generally operated up to 30 km of the coast in the vicinity of the OWF Site and cable envelopes. A section of high intensity vessel movement (21-500 vessels) is present approximately 25 km north-west of the OWF Site, with vessels accessing Corner Inlet.



4.8.6 DEFENCE

Defence uses coastal and marine areas of Australia for training and operations which may involve Navy, Air Force and Army.

The types of training that occur in maritime areas include:

- Low level flying by fixed and rotary wing aircraft;
- Ship, submarine and support craft manoeuvres;
- Weapons firings; and
- Use of air defence, navigation and air traffic control radars.

Defence also routinely undertakes operations within Australia's EEZ including:

- Border protection;
- Surveillance and interdiction;
- Hydrographic survey;
- Search and rescue; and
- Humanitarian assistance and disaster relief (HADR).

While many of the activities may be conducted anywhere within the EEZ, training is primarily concentrated within Defence Practice Areas (DPAs). Defence uses maritime/coastal DPAs for training that involves activities that pose a significant safety risk to civilian activities were they to coincide. While many of these activities can occur outside DPAs, the declaration of a DPA gives Defence powers to control access by commercial and civilian personnel and their aircraft/vessels to improve safety and provide assurance that the activity can proceed with minimal disruption.

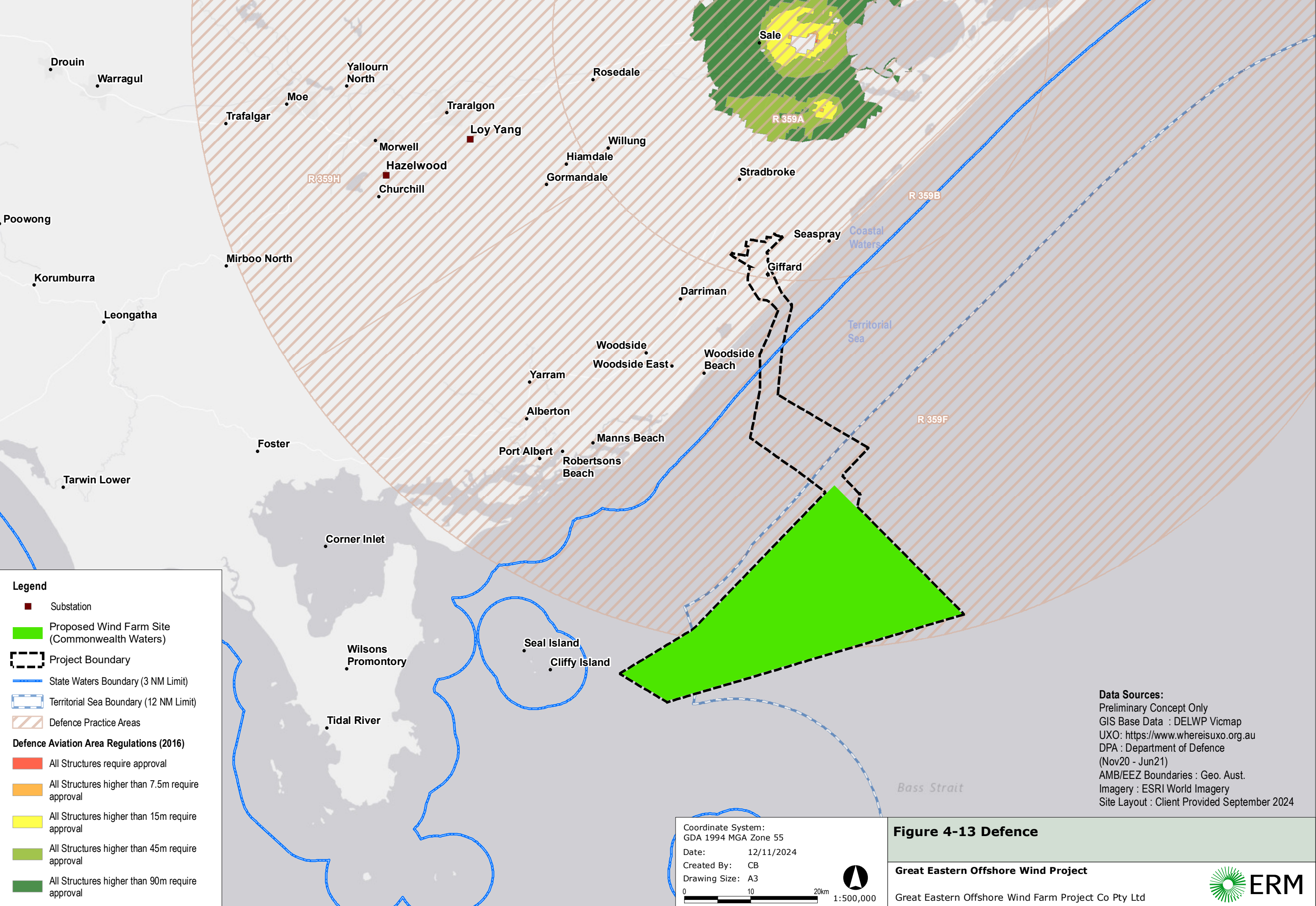
DPAs are gazetted (in the Government Gazette) and activated through the Australian Hydrographer Notices to Mariners (NTMs) and Airservices Australia Notice to Airmen (NOTAMs). Some are permanently activated; others are activated on an "as required" basis. When activated they permit Defence to close areas to civilian activities. Thus they are principally a safety tool.

The OWF Site is within DPA R359F (AHO, 2020; **Figure 4-13**). The OWF Site overlaps one DPA (R359F) associated with Defence activities from the airfield at East Sale. This DPA supports Royal Australian Air Force training from East Sale and the airspace is frequently closed from 4,000 to 21,000 feet, but occasional closures at other levels may occur as notified on the Airservices Australia website. The maritime component within R359F may also support Navy vessel and submarine activities from time to time.

Corio and ERM engaged with the Department of Defence regarding the proposed OWF Site in 2021. Corio has completed further engagement with the Department of Defence in 2023 to better understand the potential effects of constructing and operating an offshore wind farm on Defence activities. Advice provided by Defence during the 2023 meeting is summarised below:

- Defence does not see any impact on Navy (including submarine operations) from the East Sale location, although this will be more robustly tested when GEOW start making more formal approaches to the Department;
- Defence suggested no restrictions to aircraft beyond normal Civil Aviation Safety Authority controls are likely within the GEOW Project site;

- While unexploded ordinance is always a possibility, the GEOW Project site is considered low risk;
- Further consideration of cumulative effects of offshore wind projects on the existing radar systems is required;
- An outcome of the Defence Strategic Review may be an extension to the East Australian Exercise Area, Defence do not think this would impact GEOW;
- Defence seeks accurate plotting of all cables, and that this information be fed into the Australian Hydrographic Office (operated by Navy); and
- Defence suggests the offshore wind industry investigate the establishment of security sharing reference group like the existing Technical Environmental Security Network (TESN) through which the oil and gas sector have a unified approach to engaging and managing security matters.



4.8.7 CIVIL AVIATION

For civil aviation, Airservices Australia will require an Aviation Impact Assessment (AIA) to be completed to ensure that Airservices Australia and the Civil Aviation Safety Authority (CASA) support the development. CASA has confirmed that the OWF Site is subject to CASA oversight.

As part of the AIA, it is standard practice to identify and assess aerodromes within 30 NM (56 km) of the wind farm development. The OWF Site is located within 56 km of two registered aerodromes (**Figure 4-14**).

- Yarram Airport (approximately 38 km to the west of the OWF Site).
- Gleneagles Park Station Airstrip (approximately 44 km to the north north-east of the OWF Site).
- Offshore helipads are also present in the region, associated with offshore oil and gas platforms, including the Bass Strait area to be Avoided (ABTA). The ABTA is located to the east of Lakes Entrance extending more than 50 km offshore. Oil rigs with helipads are present within 56 km of the OWF Site.

Other aerodromes are within a larger radius from the site. These include:

- RAAF East Sale (approximately 65 km to the north north-west of the OWF Site);
- Longford Heliport (approximately 52 km to the north north-west of the OWF Site);
- West Sale Airport (approximately 69 km to the north north-west of the OWF Site);
- Welshpool Aerodrome (approximately 43 km to the west of the OWF Site);
- Fish Creek Airport (approximately 72 km to the west of the OWF Site);
- Wilsons Promontory Heliport (approximately 42 km to the southwest of the OWF Site); and
- Tidal River Airport (approximately 48km to the west of the OWF Site).

4.8.8 RADAR

Air Traffic Control Radars

Air traffic control (ATC) is used to manage the safe and orderly passage of aircraft within Australian airspace. The management of ATC is complex in Australia and involves several organisations:

- Air Services Australia (ASA) is the Australian Government owned agency responsible for air traffic control, with jurisdiction over 11% of the world's airspace (20 million nm²). ASA provides ATC services to meet Commonwealth standards.
- The Commonwealth CASA is Australia's safety regulator for civil air operations. Through the Office of Airspace Regulation, it has responsibility for airspace regulation.
- The Department of Defence (Defence) is responsible for military aviation operations and air traffic control at airports with a shared civil and military use. ASA and Defence deliver a single civil-military air traffic control system within the Australian jurisdiction.

Airservices uses both terminal area radars (TAR) and en-route radars to assist with separation of aircraft in controlled airspace. At major airports it is common to have both radars in use. Known as primary radar, TAR will detect an aircraft's position, height and approximate airspeed. TARs are useful for detecting aircraft in controlled airspace close to the airports. En-route radars, or secondary surveillance radar, relies on an aircraft having a transponder which

transmits a data signal. The signal is received and interrogated by a ground station. En-route radars cover airspace 250 nm (463 kilometres) in radius and up to 100,000 ft. (30 kilometres) altitude.

The Melbourne Air Traffic Services Centre is responsible for activities within the Melbourne flight information region (FIR) which includes the southern half of Australia and the Southern and Indian oceans. The OWF Site is located within the Melbourne FIR.

RAAF Base East Sale supports military flying training occurs in locally published training areas and special use airspace within the Defence Practice Areas R358A-E, and the East and West Sale circuit areas. Air Traffic Control (ATC) services are provided by No 453 Squadron East Sale Flight. The OWF Site is within East Sale Restricted Airspace Sector R359F and subject to ATC from RAAF East Sale. This sector extends from 20 to 50 nm from East Sale Airport.

Meteorological Radars

The BOM has established a national Weather Watch Radar Network of over 60 weather radars that collect rainfall echoes from clouds located between 2,500 m and 3,500 m above ground. Each radar is able to provide optimal radar coverage out to 200 km. The BOM stitches the signals from multiple radars to provide near-real time images of conditions up to a national scale.

The BOM has one operational weather radar site with coverage over the OWF Site. The Gippsland radar is sited at Bairnsdale airport about nine kilometres south-west of the city of Bairnsdale. The radar provides weather information for south eastern Victoria from the crest of the Great Dividing Range along the coastal plains of east, central and west Gippsland and eastern Bass Strait. The Gippsland radar is approximately 103 km north of the OWF Site.

Aircraft Radar

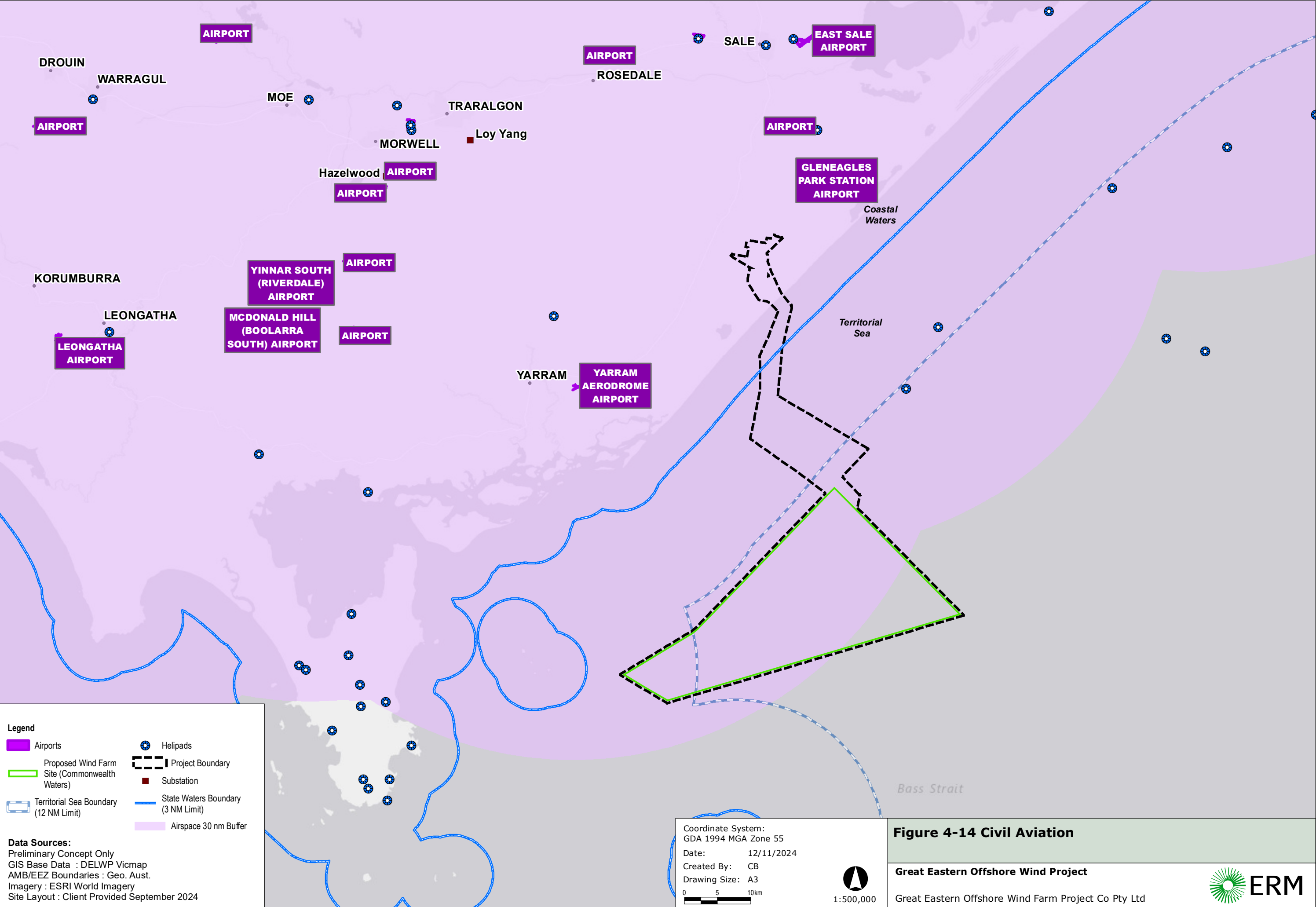
Coastal and marine areas of Bass Strait are routinely used for both commercial and private flying. Most larger and many smaller aircraft may be fitted with radars including:

- Weather radar;
- Radar altimeter; and
- Terrain proximity radar.

The airspace above the OWF Site will be considered as part of an Aviation Impact Assessment, including limitations on low level flying and other airspace.

Civil Vessel Navigation Radars

Coastal and marine areas of Bass Strait are routinely used by commercial shipping and recreational vessels. Victoria's DEECA CoastKit website shows that smaller commercial and recreational vessels transit the OWF Site, with larger commercial vessel traffic generally offshore from the OWF Site. Commercial vessels will be fitted with navigation radar as part of their broader navigation suite. These radars may potentially experience interference and shadowing similar to aviation radars. These risks are normally managed through exclusion zones and traffic management schemes that are designated on relevant nautical charts.



4.8.9 TOURISM AND RECREATION

Tourism

The Gippsland region is popular with visitor from Melbourne as well as inter-state and international visitors. Key attractions include Wilsons Promontory National Park, Ninety Mile Beach and the waterways of Lakes Entrance and Corner Inlet.

The rest of the coastline is also popular with visitors and residents, with the coastal townships of Mcloughlins Beach, Woodside Beach, Seaspray, the Honeysuckles, Golden Beach and Paradise Beach being key destinations.

Key tourism and recreation features are presented in **Figure 4-15**.

Recreational boating

Victoria is popular location for recreational boating, which supports the local economy for recreational fishing, tourism and diving. Recreational boating in the vicinity of the OWF Site is supported from boat ramps in Corner inlet and Lakes Entrance. There are various fishing charter companies and wildlife cruises operating from Corner Inlet and Lakes Entrance. The OWF Site is relatively distant offshore and so recreational vessel traffic would be reduced.

Recreational fishing

Several recreational fishing areas occur within the OWF Site and the cable envelopes. This includes beach fishing and boat fishing. Ninety Mile Beach is an iconic beach fishing destination that affords many locations. Some fishermen launch boats from the beach to access inshore rocky reefs. Offshore fishing is a popular activity with vessels operating from both Corner Inlet and Lakes Entrance.

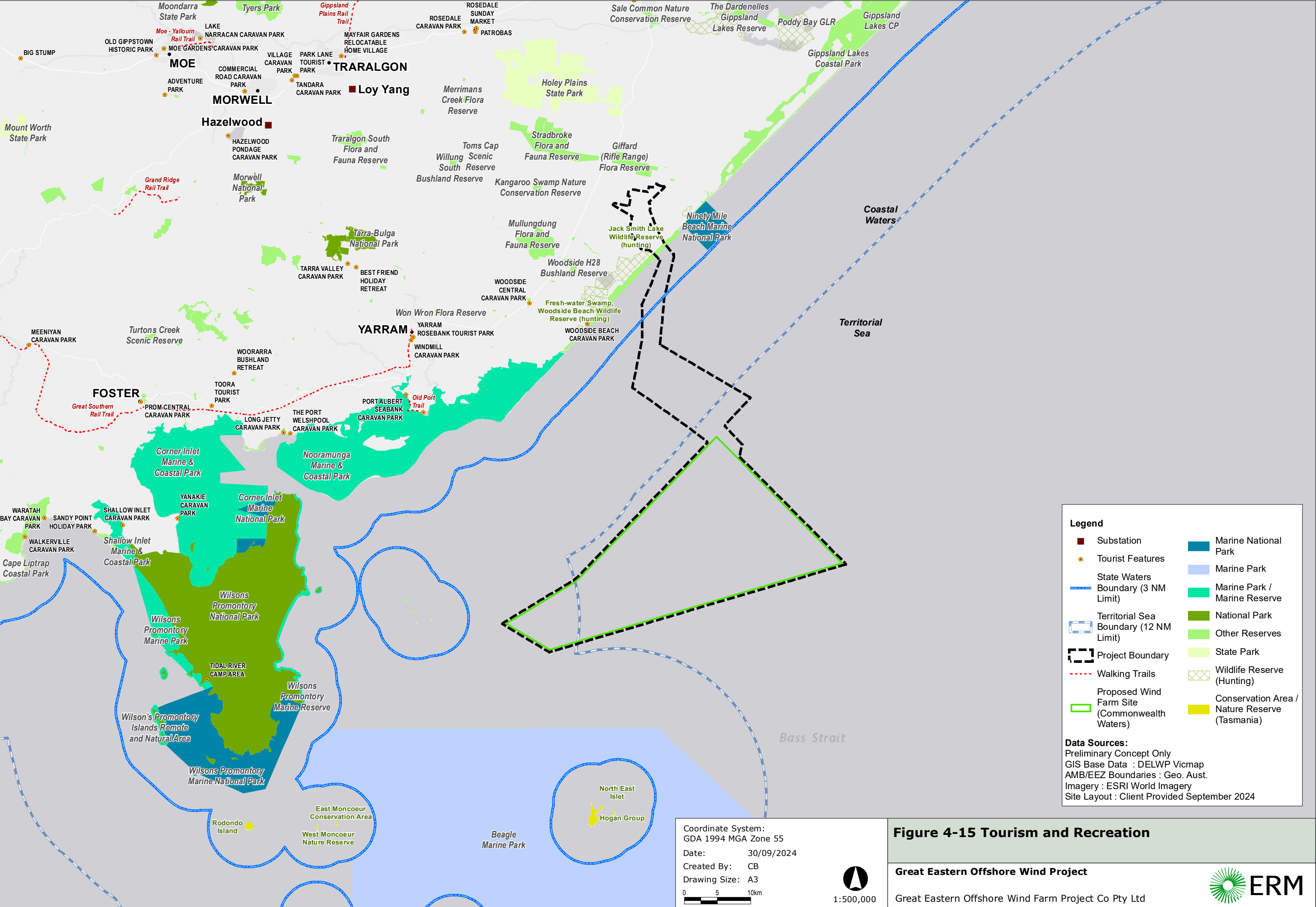
Water sports

A range of water sports are understood to occur along the coast, including swimming, SCUBA diving, snorkelling, surfing, kite surfing and wind surfing. These activities will take place at most popular beaches along Ninety Mile Beach and at Wilson's Promontory.

Community consultation is required to better understand the locations and level of use of recreational activities.

Coastal walking trails

A number of national parks and state reserves are present along the coastline which provide popular walking trails and coastal lookouts. These include walking trails at Wilsons Promontory, Ninety Mile Beach, Mcloughlins Beach and eastwards towards Lakes Entrance.



4.8.10 EXISTING OFFSHORE INFRASTRUCTURE

The CoastKit tool was used to identify other marine users in the OWF Site and cable envelopes. Operational offshore infrastructure lies within or close to the OWF Site and cable envelopes as indicated by the Victorian CoastKit website (**Figure 4-16**):

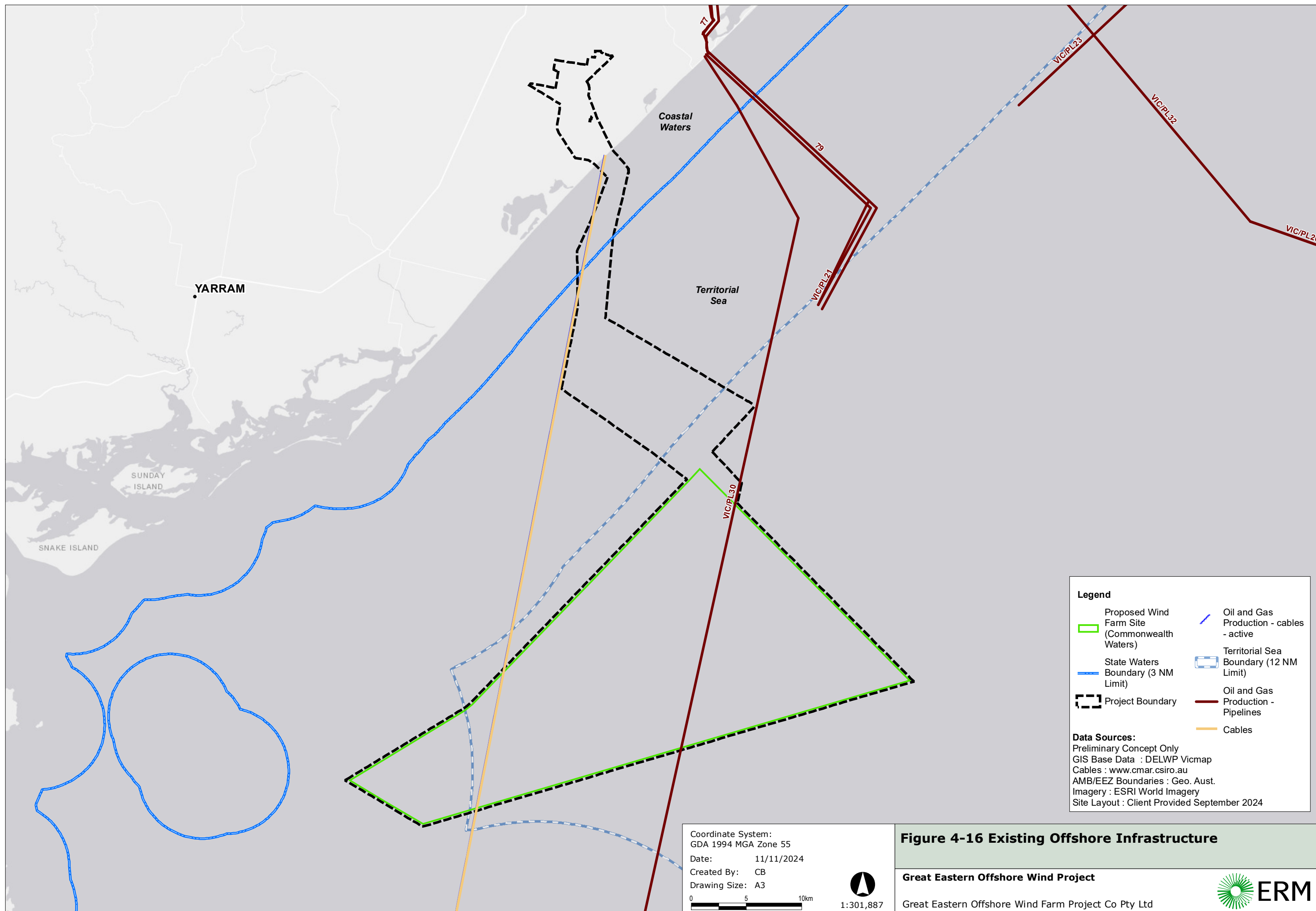
- The Tasmanian Gas Pipeline (TGP) is a transmission pipeline operating and transporting gas from Longford in southern Victoria to northern Tasmania which transits through the OWF Site. The pipeline is owned by Palisade Investment Partners (PIP) and operated by the Zinfra Group (AEMC 2022). The pipeline is 740 km in length, including approximately 300km of sub-sea pipeline.
- The Basslink HVDC Interconnector and telecoms cable (Telstra/Basslink Telecoms) pass thorough the OWF Site and cable envelopes.

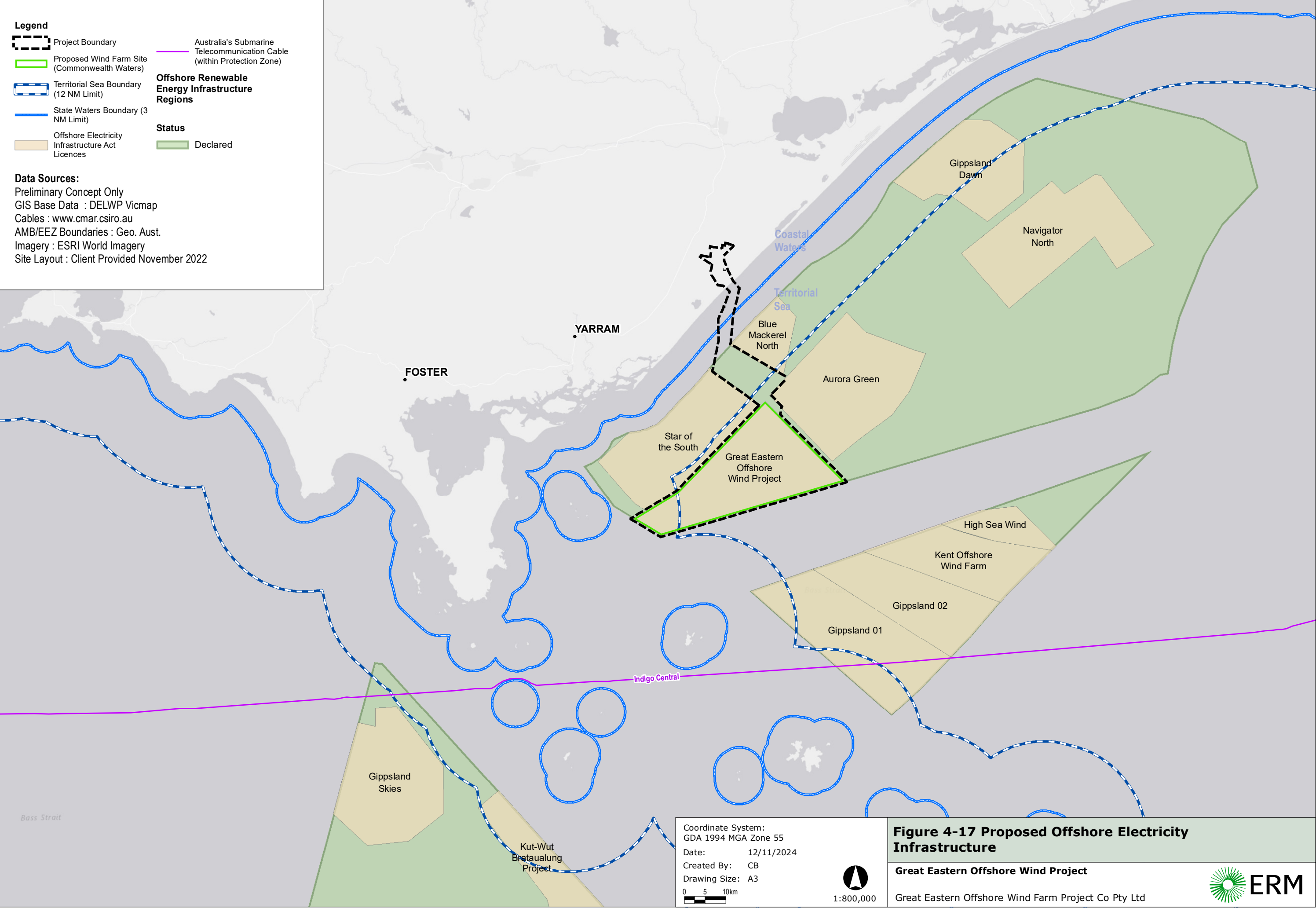
Several offshore oil and gas facilities are located to the north-east of the OWF Site, many of which are located in the 'Area to be Avoided', an area gazetted under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.

4.8.11 PROPOSED OFFSHORE INFRASTRUCTURE

CarbonNet are proposing a carbon capture and storage (CCS) project to the north-east of the site and have an exploration licence that overlaps with the OWF site.

In December 2022, the Australian government announced the Gippsland Declared Area under the OEI Act. Feasibility Licences have been granted to 12 offshore wind projects within the Gippsland Declared Area, the closest of which (Star of the South) is located inshore of the OWF Site, sharing most of its north-western boundary, while Iberdrola's proposed Aurora Green project is 1.4 km to the north east of the OWF Site (**Figure 4-17**).





5. PRELIMINARY ASSESSMENT

This section presents the results of a preliminary assessment of the potential impacts of the Project on MNES and on state values in relation to any EES referral criteria that relate to marine matters.

The outcomes of each of the preliminary assessments are based upon the Project being developed in isolation of other offshore developments. Corio understands that cumulative effects associated with the construction and operation of multiple offshore wind farms in the Gippsland region will be a critical issue for regulators, requiring consensus on assessment approach and data/information requirements. Noting the complexity of this issue, cumulative effects have not been considered at this stage but will be incorporated into the detailed environmental impact assessments (EIAs).

5.1 IDENTIFICATION OF POTENTIAL EFFECTS AND MITIGATION

This section presents a systematic review of the various Project aspects, potential environmental effects and standard mitigation measures that are likely to be in place. **Table 5-1** and Table 5-2 identify the following:

- Aspects relevant to Project activities during various stages (i.e. Construction, Operation, and Decommissioning), based on the Project Description, that can result in environmental effects and impacts;
- Key environmental effects that may arise from such aspects, and the key receptor groups that may be impacted;
- Studies and surveys to be undertaken relevant each identified receptor group affected; and
- Mitigation measures drawn from legislation and standard industry practices in Australia to manage and reduce the magnitude of the impacts that may occur.

Project aspects include those associated with both planned activities (as per the Project Description) and the risk of unplanned events occurring (e.g., spills, vessel strike). The Project aspects and effects identified in **Table 5-1** and Table 5-2 are consistent with the key impact sources and pathways identified in DCCEEW Guidance on *Key environmental factors for offshore windfarm environmental impact assessment under the EPBC Act 1999* (Commonwealth of Australia, 2023d). Effects are identified as those that are primarily direct effects from aspects and activities within Commonwealth waters or state waters, or indirect effects within state waters from Project components in Commonwealth waters (e.g., the OWF Site), such as underwater noise emissions propagating into state waters during construction. All impacts associated with works in Commonwealth waters will be assessed through the EPBC assessment process.

The identified mitigation measures include those legislated and those considered standard industry practice in Australia. These are considered the minimum measures that would be implemented during the Project. Note that a comprehensive suite of additional mitigation measures will also be implemented for the Project, which will be informed by the more detailed EIA process and captured in the environmental management framework for the project.

5.1.1 ACTIVITIES IN COMMONWEALTH WATERS

The assessment provided in Table 5-1 is based on the proposed activities within Commonwealth waters, as described in Section 2 of this report, including:

- Construction and installation of project infrastructure within the OWF Site (e.g., turbines, inter-array cables and substation) (see Section 2.4.1)
- Construction and installation of the offshore export cable within the Offshore Cable Envelope (see Sections 2.4.2 – 2.4.3)
- Vessel activities in Commonwealth waters (see Section 2.4.4)
- Operation and maintenance activities in Commonwealth waters (see Section 2.5)
- Decommissioning activities in Commonwealth waters (see Section 2.6).

TABLE 5-1 IDENTIFICATION OF POTENTIAL EFFECTS AND KEY MITIGATION MEASURES – COMMONWEALTH ACTIVITIES

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
PLANNED ACTIVITIES			
Project vessels – Routine discharges (e.g., sewage, waste, oily water) (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Marine and coastal water quality • Benthic communities • Fish communities 	<ul style="list-style-type: none"> • Highly localised changes in water quality. • Potential direct toxicity to benthic flora and invertebrates. • Potential ingestion of pollutants by fishes. 	<ul style="list-style-type: none"> • Vessel discharges will be managed in accordance with Australian and international maritime legislation (e.g., Marine Orders, International Convention for the Prevention of Pollution from Ships [MARPOL]).
Seabed disturbance (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Marine and coastal water quality • Benthic habitats and communities • Marine and coastal processes and morphology • Shoreline and intertidal habitats • Subsea cables and pipelines • Underwater cultural heritage 	<ul style="list-style-type: none"> • Direct disturbance/loss of benthic habitat in footprint of project infrastructure. • Suspended sediments and sediment deposition resulting in reduced water quality and or smothering of benthic organisms. • Localised scour around installed foundations. 	<ul style="list-style-type: none"> • Micro-siting of project infrastructure to avoid sensitive habitats where possible using results from geophysical, geotechnical and benthic habitat surveys. will inform locations and micro-siting of project infrastructure to avoid sensitive habitats where possible.

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
		<ul style="list-style-type: none"> Shore crossing activities may result in disturbance to subtidal/intertidal habitats. Localised changes to wave and current regime as result of installed infrastructure Subsea cable burial and foundation installation may result in disturbance of underwater cultural heritage 	<ul style="list-style-type: none"> Hydrodynamic modelling will be used to assess OWF Site design and requirement for scour protection around foundations. Micro-siting of project infrastructure, and selection of cable routes and shore crossing sites to avoid or minimise disturbance to TECs and other sensitive habitats. Micro-siting of project infrastructure to avoid disturbance to historic shipwrecks and sites of cultural heritage significance. Consultation with third party cable and pipeline operators and design measures to avoid disturbance to existing infrastructure.
Underwater noise and vibration (construction, operations and decommissioning)	<ul style="list-style-type: none"> Benthic invertebrates Fish Marine mammals Turtles Diving / foraging seabirds Commercial or recreational SCUBA divers / free divers 	<ul style="list-style-type: none"> Behavioural avoidance and behavioural changes resulting from construction / vessel / decommissioning noise. High magnitude impulsive sound (e.g. during foundation installation) has the potential for physical effects (temporary, permanent hearing impairment or injury) of some organisms at close range. High accumulated sound exposures may result in temporary or permanent hearing impairment to some organisms. Masking or interference with biologically important sounds 	<p>Marine fauna and bird surveys will be undertaken to better characterise the species that utilise the OWF Site and surrounding waters at different times of year.</p> <p>Acoustic modelling will assess the potential effects of underwater noise, including the use of bubble curtains and other noise abatement systems. Underwater noise management procedures for foundation installation will be consistent with relevant sections of EPBC Policy Statement 2.1 and South Australia's Underwater Piling and Dredging Noise Guidelines,, including:</p> <ul style="list-style-type: none"> Observation and shutdown zones

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
		<p>(including vocal communication, echolocation, signals and sounds produced by predators or prey).</p> <ul style="list-style-type: none"> Behavioural disturbance, resulting in indirect reduction in prey species. 	<ul style="list-style-type: none"> Soft-start procedures Shutdown procedures Night time / low visibility procedures. <p>Subject to the outcomes of marine fauna surveys and detailed underwater noise impact assessment, the project will also consider additional noise monitoring and mitigation where practicable, for example:</p> <ul style="list-style-type: none"> Passive Acoustic Monitoring (PAM) Engineering solutions Adaptive management procedures for sensitive species and life stages.
Underwater noise and vibration (operations – turbines)	<ul style="list-style-type: none"> Marine mammals Fish Turtles Diving / foraging seabirds 	<ul style="list-style-type: none"> Localised behavioural avoidance and behavioural changes. Localised masking or interference with biologically important sounds. 	A more detailed assessment of operational underwater noise will be undertaken to ascertain if any impacts will occur and if mitigation is required.
Physical presence of infrastructure (sea) (construction, operation and decommissioning)	<ul style="list-style-type: none"> Shipping and navigation Commercial fisheries Recreational fishers and boating Other industry and other marine users 	<ul style="list-style-type: none"> Temporary displacement of activities during construction (due to exclusion zones around individual foundations and works). Displacement of vessels from around operating turbines and substations. Cable crossings with subsea cables and pipelines may alter arrangements for access and maintenance. Note: Corio expects that many types of fishing practices can continue within an operational offshore wind project, as has been demonstrated on projects overseas. 	<ul style="list-style-type: none"> Engagement with AMSA, AHO, Department of Transport and regional port authorities regarding safe navigation. Engagement with commercial and recreational fishing representatives to explore opportunities for coexistence of activities. Stakeholder consultation and notifications. Notice to Mariners. Infrastructure locations marked on nautical charts. Establishment and communication of safety zones. Navigational aids.

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
			<ul style="list-style-type: none"> • Marine navigational lighting on turbines. • Potential establishment of vessel traffic separation / shipping fairways around the OWF Site. • Cable crossing agreements, simultaneous operations (SIMOPS) and access arrangements with subsea cable and pipeline operators.
Physical presence of infrastructure (air) (operation)	<ul style="list-style-type: none"> • Defence • Aviation • Radar 	<ul style="list-style-type: none"> • Potential alteration of flight paths. • Interference with radar systems. 	<ul style="list-style-type: none"> • Stakeholder consultation. • Aviation Impact Assessment to the satisfaction of CASA and Airservices Australia. • Aviation obstruction lighting on turbines. • Marking of turbines on aeronautical charts. • Radar repeaters/infill, if required (subject to further engagement with Defence, CASA, Airservices Australia and BOM).
Physical presence of infrastructure (visual) (construction and operation)	<ul style="list-style-type: none"> • Coastal communities • Tourism • Marine vessels 	<ul style="list-style-type: none"> • Changes to landscape/seascape. • Changes to character and visual amenity. 	<ul style="list-style-type: none"> • Stakeholder consultation. • Visual impact assessment. • Lighting minimised to comply with aviation and navigational requirements.
Physical presence of infrastructure (collision risk and– barrier effects) (operation)	<ul style="list-style-type: none"> • Foraging seabirds • Migratory shorebirds • Migratory land birds 	<ul style="list-style-type: none"> • Potential mortality or injury to birds that collide with turbines. • Barrier to migration of individuals flying through the OWF Site. • Displacement of seabirds from the OWF Site. 	<ul style="list-style-type: none"> • Bird surveys will be undertaken to better characterise the species that utilise the OWF Site at different times of year. • Collision modelling and a collision risk assessment will be undertaken

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
			to inform design and mitigation strategies.
Physical presence of Project vessels (construction, operation and decommissioning)	<ul style="list-style-type: none"> Shipping and navigation Commercial fisheries Recreational fishers and boating Other industry and other marine users 	<ul style="list-style-type: none"> Localised avoidance of Project vessels and mooring spreads by other vessels and other marine users. 	<ul style="list-style-type: none"> Stakeholder consultation and notifications. Notice to Mariners. Vessels and crew will be compliant with Australian standards and regulations for safety, navigation and communications systems. Compliance with the International Regulations for Preventing Collisions at Sea (COLREGs). Vessels to use required signals, lighting and shapes. Proponent commitment to sharing waters with other users to the extent possible.
Artificial habitat creation (foundations, scour protection) (construction and operation)	<ul style="list-style-type: none"> Benthic habitats and communities Fish communities Commercial and recreational fisheries 	<ul style="list-style-type: none"> Introduction of artificial structures and hard substrate on which sessile organisms may establish. Artificial reef effects e.g., potential attraction of fishes to structures (localised changes in abundance, distribution, community composition). 	
Artificial lighting (vessel lighting, aviation obstruction lighting, marine navigational lighting) (construction, operation and decommissioning)	<ul style="list-style-type: none"> Fish Turtles Birds 	<ul style="list-style-type: none"> Attraction, disorientation effects. Attraction of prey species. 	<ul style="list-style-type: none"> Limit lighting on vessels during construction, maintenance and decommissioning to that required for safe operations. Consultation with Defence, CASA and Airservices Australia regarding aviation obstruction lighting requirements.

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
			<ul style="list-style-type: none"> • Consultation with AMSA, Department of Transport and Planning and regional port authorities regarding marine navigational lighting requirements. • Consider mitigation measures to further reduce impacts to fauna (e.g., different coloured lighting), where practicable. • Lighting management plan for shoreline crossing activities located near sensitive habitats or populated areas.
Electro-magnetic fields (EMF) – Export cables and inter-array cables (operation)	<ul style="list-style-type: none"> • Fish 	<ul style="list-style-type: none"> • Highly localised interference with detection of prey and predators for species of sharks and rays sensitive to electric fields. 	<ul style="list-style-type: none"> • Cable burial (0.5-5.0 m below the seabed) to ensure marine traffic such as fishing vessels or ship anchors do not damage the cable. • Burial depth will be determined by conducting a Cable Burial Risk Assessment to identify the range of natural and anthropological hazards present along the route, quantify their risk to the cable systems and determine the most appropriate measure of protection. • Where burial is not possible and the cables are considered to be at risk, additional mechanical protection in the form of rock, concrete mattresses or specialist cable protection systems will be installed.

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
RISKS			
Unplanned event – Vessel strike (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Marine mammals • Turtles 	<ul style="list-style-type: none"> • Injury or mortality of marine fauna. 	<ul style="list-style-type: none"> • Application of EPBC Regulations 2000, Part 8, Division 8.1 for vessel speeds and approach distances for marine mammals, including the use of marine mammal observers and investigating and defining project transport routes (e.g., from port to site).
Unplanned event – Introduction of invasive marine species (IMS) (biofouling, ballast water) (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Benthic habitats and communities • Fish communities • Marine fauna and birds • Commercial fisheries • Aquaculture 	<ul style="list-style-type: none"> • Competition and changes in community composition. • Competition for prey species. • Reduction in available habitat. 	<ul style="list-style-type: none"> • Compliance with <i>Biosecurity Act 2015</i> requirements. • Australian ballast water management requirements. • National biofouling management guidance.
Unplanned event – Dropped objects and waste from vessels (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Benthic habitats and communities • Fish communities • Marine fauna and birds • Commercial fisheries • Aquaculture 	<ul style="list-style-type: none"> • Localised disturbance to benthic habitats • Ingestion or entanglement resulting in mortality • 	<ul style="list-style-type: none"> • Lifting procedures. • Waste management plan and record book (in accordance with Australian Marine Orders and MARPOL).
Unplanned event – Fuel / chemical spills (e.g., minor deck spill, refuelling spill, or vessel collision resulting in major spill incident) (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Benthic habitats and communities • Shoreline habitats • Fish communities • Marine fauna and birds • Commercial fisheries • Aquaculture • Tourism and recreation 	<ul style="list-style-type: none"> • Changes in water quality and sediment quality. • Pollution and contamination of shoreline habitats and wetlands. • Fouling, injury or mortality of marine fauna. • Fouling, injury or mortality of birds. • Toxic effects to fishes. • Hazard to other vessels. • Fouling of other vessels, fishing equipment. 	<ul style="list-style-type: none"> • Appropriate storage of products on vessels. • Refuelling/bunkering procedures. • Spill clean-up kits on vessels • Vessels and crew will be compliant with Australian standards and regulations for safety, navigation and communications systems. • Compliance with the International Regulations for Preventing Collisions at Sea (COLREGs).

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
		<ul style="list-style-type: none"> Impacts on livelihoods (fisheries, aquaculture). 	<ul style="list-style-type: none"> Vessels to use required signals, lighting and shapes. Shipboard Oil Pollution Emergency Plans (SOPEPs) Access to spill response capability and oiled wildlife response capability.

5.1.2 ACTIVITIES IN VICTORIAN COASTAL WATERS

The assessment provided in Table 5-2 is based on the proposed project activities within Victorian coastal waters, as described in Section 2 of this report, which are limited to:

- Construction and installation of the offshore export cable within the Nearshore Cable Envelope (see Sections 2.4.2 – 2.4.3)
- Vessel activities within Victorian coastal waters (see installation vessel discussion in Section 2.4.4)
- Operation and maintenance activities relevant to offshore export cables in Victorian coastal waters (see Section 2.5)
- Decommissioning activities relevant to offshore export cables in Victorian coastal waters (see Section 2.6).

TABLE 5-2 IDENTIFICATION OF POTENTIAL EFFECTS AND KEY MITIGATION MEASURES – VICTORIAN COASTAL WATERS ACTIVITIES

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
PLANNED ACTIVITIES			
Seabed / shoreline disturbance (construction, operation)	<ul style="list-style-type: none"> Marine and coastal water quality Benthic habitats and communities Marine and coastal processes and morphology 	<ul style="list-style-type: none"> Direct disturbance/loss of benthic habitat in footprint of project infrastructure. Suspended sediments and sediment deposition resulting in reduced water quality and or smothering of benthic organisms. Shore crossing activities may result in disturbance to subtidal/intertidal habitats. 	<ul style="list-style-type: none"> Geophysical, geotechnical and benthic habitat surveys will inform locations and micro-siting of project infrastructure to avoid sensitive habitats where possible. Micro-siting and selection of cable routes and shore crossing sites to avoid or minimise

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
	<ul style="list-style-type: none"> Shoreline and intertidal habitats Subsea cables and pipelines Underwater cultural heritage 	<ul style="list-style-type: none"> Subsea cable burial may result in disturbance of underwater cultural heritage. 	<ul style="list-style-type: none"> disturbance to TECs and other sensitive habitats. Micro-siting of project infrastructure to avoid disturbance to historic shipwrecks and sites of cultural heritage significance. Consultation with cable and pipeline operators and design measures to avoid disturbance.
Underwater noise and vibration (construction)	<ul style="list-style-type: none"> Benthic invertebrates Fish Marine mammals Turtles Diving / foraging seabirds Commercial or recreational SCUBA divers / free divers 	<ul style="list-style-type: none"> Behavioural avoidance and behavioural changes resulting from construction / vessel / decommissioning noise. High accumulated sound exposures may result in temporary or permanent hearing impairment to some organisms. Masking or interference with biologically important sounds (including vocal communication, echolocation, signals and sounds produced by predators or prey). Behavioural disturbance, resulting in indirect reduction in prey species. 	<p>Marine fauna and bird surveys will be undertaken to better characterise the species that utilise the project area and surrounding waters at different times of year.</p> <p>Acoustic modelling will assess the potential effects of underwater noise from activities in coastal waters.</p>
Physical presence of infrastructure (sea) (construction, operation and decommissioning)	<ul style="list-style-type: none"> Shipping and navigation Commercial fisheries Recreational fishers and boating Other industry and other marine users 	<ul style="list-style-type: none"> Temporary displacement of activities during construction (due to exclusion zones around works). Cable crossings with subsea cables and pipelines may alter arrangements for access and maintenance. 	<ul style="list-style-type: none"> Engagement with AMSA, AHO, Department of Transport and regional port authorities regarding safe navigation. Stakeholder consultation and notifications. Notice to Mariners. Infrastructure locations marked on nautical charts. Establishment and communication of safety zones. Navigational aids. Marine navigational lighting on turbines. Cable crossing agreements, simultaneous operations (SIMOPS) and access arrangements with subsea cable and pipeline operators.

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
Physical presence of Project vessels (construction, operation and decommissioning)	<ul style="list-style-type: none"> Shipping and navigation Commercial fisheries Recreational fishers and boating Other industry and other marine users 	<ul style="list-style-type: none"> Localised avoidance of Project vessels and mooring spreads by other vessels and other marine users. 	<ul style="list-style-type: none"> Stakeholder consultation and notifications. Notice to Mariners. Vessels and crew will be compliant with Australian standards and regulations for safety, navigation and communications systems. Compliance with the International Regulations for Preventing Collisions at Sea (COLREGs). Vessels to use required signals, lighting and shapes.
Artificial habitat creation (armoured cable) (construction and operation)	<ul style="list-style-type: none"> Benthic habitats and communities Fish communities Commercial and recreational fisheries 	<ul style="list-style-type: none"> Introduction of artificial structures and hard substrate on which sessile organisms may establish. Artificial reef effects e.g., potential attraction of fishes to structures (localised changes in abundance, distribution, community composition). Marine ecosystems may benefit from the presence of subsea infrastructure, by creating hard substrate for benthic fauna to colonise, and in turn providing habitat for some fish species. 	<ul style="list-style-type: none"> Subsea infrastructure located to minimise disturbance to sensitive benthic habitats and ecological communities.
Artificial lighting (construction and maintenance vessels) (construction, operation and decommissioning)	<ul style="list-style-type: none"> Fish Turtles Birds 	<ul style="list-style-type: none"> Attraction, disorientation effects. Attraction of prey species. 	<ul style="list-style-type: none"> Limit lighting on vessels during construction, maintenance and decommissioning to that required for safe operations. Lighting management plan for shoreline crossing activities located near sensitive habitats or populated areas.
Electro-magnetic fields (EMF) – Export cables (operation)	<ul style="list-style-type: none"> Fish 	<ul style="list-style-type: none"> Highly localised interference with detection of prey and predators for species of sharks and rays that are sensitive to electric fields. 	<ul style="list-style-type: none"> Application of standard measures for cable burial and/or protection, with details to be informed by a Cable Burial Risk Assessment.
RISKS			
Unplanned event – Vessel strike	<ul style="list-style-type: none"> Marine mammals Turtles 	<ul style="list-style-type: none"> Injury or mortality of marine fauna. 	<ul style="list-style-type: none"> Application of EPBC Regulations 2000, Part 8, Division 8.1 for vessel speeds and approach distances for marine mammals,

Project Aspect	Receptors	Summary of Potential Effects	Planned Studies and Mitigation Measures
(construction, operation and decommissioning)			including the use of marine mammal observers.
Unplanned event – Introduction of invasive marine species (IMS) (biofouling, ballast water) (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Benthic habitats and communities • Fish communities • Marine fauna and birds • Commercial fisheries • Aquaculture 	<ul style="list-style-type: none"> • Competition and changes in community composition. • Competition for prey species. • Reduction in available habitat. 	<ul style="list-style-type: none"> • Compliance with <i>Biosecurity Act 2015</i> requirements. • Australian ballast water management requirements. • National biofouling management guidance.
Unplanned event – Dropped objects and waste from vessels (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Benthic habitats and communities • Fish communities • Marine fauna and birds • Commercial fisheries • Aquaculture 	<ul style="list-style-type: none"> • Localised disturbance to benthic habitats • Ingestion or entanglement resulting in mortality 	<ul style="list-style-type: none"> • Lifting procedures. • Waste management plan and record book (in accordance with Australian Marine Orders and MARPOL).
Unplanned event – Fuel / chemical spills (e.g., minor deck spill, refuelling spill, or vessel collision resulting in major spill incident) (construction, operation and decommissioning)	<ul style="list-style-type: none"> • Benthic habitats and communities • Shoreline habitats • Fish communities • Marine fauna and birds • Commercial fisheries • Aquaculture • Tourism and recreation 	<ul style="list-style-type: none"> • Changes in water quality and sediment quality. • Pollution and contamination of shoreline habitats and wetlands. • Fouling, injury or mortality of marine fauna. • Fouling, injury or mortality of birds. • Toxic effects to fishes. • Hazard to other vessels. • Fouling of other vessels, fishing equipment. • Impacts on livelihoods (fisheries, aquaculture). 	<ul style="list-style-type: none"> • Appropriate storage of products on vessels. • Refuelling/bunkering procedures. • Spill clean-up kits on vessels • Vessels and crew will be compliant with Australian standards and regulations for safety, navigation and communications systems. • Compliance with the International Regulations for Preventing Collisions at Sea (COLREGs). • Vessels to use required signals, lighting and shapes. • Shipboard Oil Pollution Emergency Plans (SOPEPs) • Access to spill response capability and oiled wildlife response capability.

5.2 LIKELIHOOD OF OCCURRENCE ASSESSMENT

To inform the preliminary assessment of impacts on EPBC Act and FFG Act-listed Threatened and Migratory species and TECs, a review of all species and communities identified in the PMST and VBA searches (**Appendix A**) has been undertaken. An assessment of the likelihood of occurrence of each species or ecological community has been undertaken and is available in **Appendix C**.

The likelihood of occurrence assessment considered a range of information for each species and community to establish whether they will occur within the OWF Site or the cable envelopes (collectively referred to as the 'Study Area'), including:

- The PMST search presence assessment (i.e., known to occur, likely to occur, or may occur);
- Species distribution, habitat and migration behaviours (inferred from species/community profiles in the SPRAT database);
- The occurrence of BIAs; and
- Records of species previously occurring in the OWF Site, cable envelopes or adjacent waters based on ALA or VBA records.

A likelihood ranking was determined for each species or community, guided by the criteria and ratings included in **Table 5-2**. The likelihood of occurrence assessment has been used to inform the preliminary impact assessments in **Section 5.2** and **Section 5.4**.

Noting there is a deficiency of data for many species in the area, a conservative approach was applied to the likelihood of occurrence ranking.

TABLE 5-3 LIKELIHOOD OF OCCURRENCE ASSESSMENT CRITERIA AND RATINGS

Description	Recorded in Study Area (ALA records, known to occur or likely to occur distribution)	Recorded in Study Area (ALA records or may occur distribution)	Not recorded within Study Area (no ALA records and no distribution)
Suitable habitat or migration known to occur within footprint/habitat common and widespread.	High	Moderate	Moderate
Suitable habitat or migration within Study Area / habitat moderately common.	Moderate	Low	Low
Restricted or no suitable habitat or migration within Study Area.	Low	Unlikely	Unlikely
Not marine – No habitat / life stage / presence expected in the OWF Site / cable envelopes	No	No	No

The assessment also considered whether the species had been identified in the PMST and VBA searches as a result of the 10 km search buffers that were applied, rather than being identified as occurring within the OWF Site and cable envelopes (refer to **Section 3.1**). Due to the spatial granularity of the data presented in the search tools as well as the 10 km search buffer, search results for marine areas included some terrestrial and freshwater species. Species with distribution and habitat that are entirely terrestrial or freshwater and not relevant to the marine environment have generally been excluded from further preliminary assessment. However, some ecological communities or species habitats (e.g. subtropical and temperate coastal saltmarsh), while not occurring in the OWF Site or cable envelopes, may occur in adjacent areas and have, therefore, been discussed in the preliminary impact assessments in **Section 5.3** and **Section 5.4** in terms of potential indirect impacts from Project activities.

An equivalent assessment of MNES relating to the terrestrial sections of the Project is provided in the GEOW Preliminary Terrestrial Ecology Report (ERM, 2024a).

5.3 POTENTIAL FOR SIGNIFICANT IMPACTS ON MNES

This section provides a preliminary, qualitative assessment of the potential for significant impacts on MNES, limited to:

- Ramsar Wetlands
- Commonwealth Marine Areas
- Listed Threatened Ecological Communities
- Listed Threatened and Migratory Species

Heritage matters are considered in the GEOW Preliminary Heritage Constraints Assessment (ERM 2024b); and the Great Barrier Reef, nuclear actions and coal seam gas/large coal mining does not apply to the Project.

Each significant impact criterion is assessed as 'Potential for significant impact', 'Unlikely' or 'No'. Project aspects are assessed as having 'Potential for significant impact' if a significant impact is either likely or there is currently uncertainty about the Project or the potential impacts that prevents it from being determined as 'Unlikely' or 'No'.

Consistent with Commonwealth of Australia 2013a, the preliminary assessment of impacts to MNES considers the application of legislated mitigation and standard industry practice mitigation in Australia when determining if there is a potential for a significant impact to occur. If there is still a possibility of a significant impact to MNES to occur with standard mitigation in place, or if there is scientific uncertainty about impacts that have the potential to be serious or irreversible, impacts have conservatively been assessed as having the potential for a significant impact to MNES. With the introduction of industry best practice management and mitigation measures, impacts may be reduced and not significant, but this is subject to further detailed environmental impact assessment.

The assessment of impacts on EPBC Act-listed Threatened and Migratory species and TECs has partly been informed by the likelihood of occurrence assessment (**Appendix C**), but also considers the potential for indirect effects outside of the Project Area, regardless of whether or not the TEC or species habitat occur in the OWF Site or cable envelopes.

Key focal species have been identified in some assessments, based on the species that are most likely to occur, conservation status (i.e., Critically Endangered, or Endangered

population), species with specific and relevant requirements detailed in Conservation Management Plans / Recovery Plans, or simply where a species is known to be of regulator, public or research interest in the region. Where potentially significant impacts have been identified, some of the key species that may potentially be significantly impacted have been identified. However, it is not the intent of this preliminary impact assessment to provide a complete and exhaustive list of species that may potentially be significantly impacted; data regarding distribution and habitat use within the OWF Site or cable envelopes is limited for many species and it is the intent of future studies and detailed EIA to ascertain this level of detail.

5.3.1 WETLANDS OF INTERNATIONAL IMPORTANCE (RAMSAR WETLANDS)

No potential for significant impact.

The potential for significant impacts to Ramsar wetlands is assessed in **Table 5-3**.

TABLE 5-4 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: RAMSAR WETLANDS

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in:		
<p>Areas of the wetland being destroyed or substantially modified.</p> <p>and</p> <p>A substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland.</p>	<p>The offshore components of the Project will avoid the two Ramsar sites near the Project, Corner Inlet Ramsar site and Gippsland Lakes Ramsar site and no part of the Ramsar sites would be directly disturbed.</p> <p>The key Project aspects considered relevant as having potential for indirect, 'downstream' impacts on these Ramsar sites from construction and operation include:</p> <ul style="list-style-type: none"> • Seabed / shoreline disturbance • Unplanned event – Fuel / chemical spills. <p>Seabed / shoreline disturbance</p> <p>Seabed / shoreline disturbance effects include:</p> <ul style="list-style-type: none"> • Changes to the integrity of beach and foredune sediments from construction (shore crossing) activities • Increased sedimentation from construction (shore crossing) activities • Changes to the wave and current regime, sediment transport processes and subsequent coastal morphology as a result of the OWF being in situ. <p>It is not expected that any of these indirect effects will result in the wetlands being destroyed or substantially modified, or that the hydrological regime of the wetland will change. The OWF Site is sufficient distance offshore, such that localised scour and erosion, or localised changes to waves and currents around foundations are not expected to extend to the shoreline or to the Ramsar sites, however, this will be assessed in more detail as part of the detailed environmental impact assessments for the project.</p> <p>With standard mitigation measures in place (e.g., appropriate site establishment, use of non-toxic fluids for drilling, etc.), shore crossing activities (e.g., HDD) are not expected to result in significant disturbance or deposition of sediments downstream of the works. Corner Inlet Ramsar site is located 11 km from the Offshore Cable Envelope at its closest point and the Ramsar site comprises vegetated dunes at this location. Should shore crossing activities be undertaken at this closest point shore crossing works supported by vessels offshore are not expected to modify or destroy the dunes. The nearest tide-swept channel entrance that supports the hydrological regime of the Corner Inlet Ramsar site is located approximately 25 km from the Nearshore Cable Envelope at its closest point. The channel entrance to the Gippsland Lakes Ramsar site is more than 50 km north-east of the Nearshore Cable Envelope. It is not considered credible that sedimentation and deposition from shore crossing works would extend these distances and alter the hydrological regime of either site. Coastal processes modelling is proposed to assess the extent of physical changes from the Project and will confirm that impacts are unlikely to occur.</p> <p>Unplanned event – Fuel / chemical spills</p>	Unlikely (for both criteria)

Significant Impact Criteria	Assessment	Assessment Outcome
	In the unlikely event that a fuel/chemical spill were to occur (e.g., vessel collision resulting in a ruptured fuel tank), it is possible the released hydrocarbons or chemicals could reach the Ramsar wetland, resulting in the die-off and contamination of saltmarsh habitat and resident species, and subsequent modification of the wetland. However, with the preventative and mitigative controls outlined in Section 5.1 , it is highly unlikely that such a major incident will occur.	
The habitat or lifecycle of native species, including invertebrate fauna and fish species, dependant upon the wetland being seriously affected.	<p>The offshore components of the Project will avoid the two Ramsar sites near the Project, Corner Inlet Ramsar site and Gippsland Lakes Ramsar site and no part of the Ramsar sites would be directly disturbed.</p> <p>The key Project aspects considered relevant as having potential for indirect impacts on native species within the Ramsar site are:</p> <ul style="list-style-type: none"> Underwater noise Unplanned event – Fuel / chemical spills. <p>Underwater noise</p> <p>Significant effects from underwater noise are not expected within the Ramsar wetlands. The distance over which sound would propagate from the OWF Site (minimum 25 km to Corner Inlet Ramsar site), and the shallow and complex bathymetry through the entrance channels are likely to reduce for underwater noise levels within the Ramsar site. The channel entrance to the Gippsland Lakes Ramsar site is more than 50 km north-east of the Nearshore Cable Envelope and OWF Site. Significant effects of underwater noise would not occur at that distance. It is also unlikely that underwater noise would enter the channel entrance at Lakes Entrance, which is oriented perpendicular to the direction of sound propagation, further reducing the likelihood of impact.</p> <p>Noise generated by cable shore crossing activities and Project vessels will be temporary in nature and will be undertaken in accordance with a Construction Management Plan. While it is unlikely that noise will seriously affect the life cycle of native species dependant on the wetlands, further impact assessment of the affects to native species and their life cycles (e.g. breeding bird species, juvenile fishes), is warranted should the cable shore crossing location be selected in close proximity to Corner Inlet Ramsar site.</p> <p>Acoustic modelling and a detailed assessment of underwater noise will be undertaken as part of the detailed EIA.</p> <p>Unplanned event - Fuel / chemical spills</p> <p>In the unlikely event that a fuel/chemical spill were to occur (e.g., vessel collision resulting in ruptured fuel tank), it is possible the released hydrocarbons or chemicals could reach the Corner Inlet Ramsar wetland, resulting in impacts on invertebrate, fish and other native species within the wetlands. However, with the preventative and mitigative controls outlined in Section 5.1, it is highly unlikely that such a major incident and subsequent impacts on the wetland will occur.</p>	Unlikely
A substantial and measurable change	The offshore components of the Project will avoid the two Ramsar sites near the Project, Corner Inlet Ramsar site and Gippsland Lakes Ramsar site and no part of the Ramsar sites would be directly disturbed.	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
<p>in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health.</p>	<p>The key Project aspects considered relevant as part of this preliminary assessment as having potential for indirect impacts on the Ramsar site are:</p> <ul style="list-style-type: none"> • Seabed / shoreline disturbance • Unplanned event – Fuel / chemical spills. <p>Seabed / shoreline disturbance</p> <p>Seabed disturbance effects include increased suspended sediment concentrations from foundation and cable installation activities. Seabed sediments along the coastline within the Nearshore Cable Envelope are not expected to contain significant if any levels of contamination, given the open ocean setting and absence of significant industry or other pollution sources. It is, therefore, unlikely that suspended sediments or any mobilised pollutants or changes in water quality will extend to the Corner Inlet or Gippsland Lakes Ramsar wetland to the degree that a substantial and measurable change in the water quality of the wetland would occur. The presence of CASS is acknowledged and further assessment of the potential occurrence of CASS is proposed to determine the potential mobilisation of CASS and subsequent changes in water quality. However, given that the tidal channels that supply Corner Inlet and Gippsland Lakes Ramsar sites are located 25 km and 50 km from the Nearshore Cable Envelope respectively and mitigative practices that would be put in place to avoid or minimise disturbance to CASS, substantial changes to the water quality in the Ramsar sites is highly unlikely to occur. The potential for disturbance to CASS is primarily from onshore cable/shore crossing activities, which are considered in the GEOW Preliminary Terrestrial Ecology Report (ERM, 2024a).</p> <p>Unplanned event - Fuel / chemical spills</p> <p>In the unlikely event of fuel/chemical spills, it is possible the released hydrocarbons or chemicals could reach the Ramsar wetlands, resulting in the die-off and contamination of saltmarsh habitat. However, with the preventative and mitigative controls outlined in Section 5.1, it is highly unlikely that such a major incident and subsequent impacts on the wetland will occur.</p>	
<p>An invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.</p>	<p>The offshore components of the Project will avoid the two Ramsar sites near the Project, Corner Inlet Ramsar site and Gippsland Lakes Ramsar site and no part of the Ramsar sites would be directly disturbed.</p> <p>Unplanned event – Introduction of invasive marine species (IMS) (via biofouling, ballast water)</p> <p>For an IMS to be introduced to the Ramsar wetland, it would need to survive transport to the region (e.g. in vessel ballast water or as hull/equipment biofouling), establish itself within the Project Area, and then spread to the Ramsar wetlands. This is highly unlikely because project vessels and equipment will be managed through a CEMP which will require management of IMS risks and compliance with the <i>Biosecurity Act 2015</i>.</p> <p>It is also possible that IMS could be introduced by Project vessels or baseline survey vessels that transit through other marine areas where IMS have established. The level of risk of this occurring is the same as for other vessels that transit through the area, provided that Construction Management Plan is developed and national biosecurity standards are achieved. With the control measures and compliance with legislation outlined in</p>	<p>Unlikely</p>

Significant Impact Criteria	Assessment	Assessment Outcome
	Section 5.1 , it is unlikely that IMS will be introduced or spread within either the Corner Inlet or Gippsland Lakes Ramsar sites.	

5.3.2 CRITICALLY ENDANGERED AND ENDANGERED ECOLOGICAL COMMUNITIES

No potential for significant impact.

No Critically Endangered or Endangered ecological communities occur within the offshore Project Area.

Subtropical and Temperate Coastal Saltmarsh TEC is listed as Vulnerable under the EPBC Act. The MNES Significant Impact Guidelines 1.1 (Commonwealth of Australia 2013a) states that listed ecological communities in the Vulnerable category of ecological communities listed under the EPBC Act, are not MNES for the purposes of Part 3 of the EPBC Act (requirements for environmental approvals). Therefore, no further assessment has been undertaken.

Regardless, while the TEC is present near the Nearshore Cable Envelope, significant impacts are unlikely to occur to this TEC community for the same reasons described for Ramsar wetlands in .

5.3.3 LISTED THREATENED SPECIES

The potential for significant impacts to EPBC Act-listed Threatened species is assessed in the following subsections, which consider the different significant impact criteria for Critically Endangered and Endangered species, compared to the significant impact criteria for Vulnerable species. The assessments also break listed species into different receptor groups (e.g., birds, marine mammals, etc.) in recognition of the different impact pathways and sensitivity of these groups.

5.3.3.1 CRITICALLY ENDANGERED AND ENDANGERED BIRD SPECIES

Critically Endangered and Endangered bird species relevant to the preliminary assessment are listed in **Table 5-5** and the assessment is presented in **Table 5-6**.

TABLE 5-5 CRITICALLY ENDANGERED AND ENDANGERED BIRD SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Seabirds	Shorebirds	Migratory Land Birds
Critically Endangered	None	Curlew Sandpiper <i>Calidris ferruginea</i> ; Eastern Curlew <i>Numenius madagascariensis</i>	Orange-bellied Parrot <i>Neophema hrysogaster</i> ; Swift Parrot <i>Lathamus discolor</i>
Endangered	Shy Albatross <i>Thalassarche cauta</i> ; Grey-headed Albatross <i>Thalassarche chrysostoma</i> ; Northern Royal Albatross <i>Diomedea sanfordi</i> ; Gould's Petrel <i>Pterodroma leucoptera leucoptera</i> ; Southern Giant-Petrel <i>Macronectes giganteus</i>	Australian Painted Snipe <i>Rostratula australis</i> ; Lesser Sand Plover <i>Charadrius mongolus</i> ; Nunivak Bar-tailed Godwit <i>Limosa lapponica baueri</i> ; Common Greenshank <i>Tringa nebularia</i>	None

TABLE 5-6 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: CRITICALLY ENDANGERED AND ENDANGERED BIRD SPECIES

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Critically Endangered or Endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	<p>The key Project aspect considered relevant as part of this preliminary assessment as having potential for impacts on Critically Endangered and Endangered birds is Physical presence of infrastructure-collision risk and barrier effects.</p> <p>Operating offshore turbines present a potential collision risk and barrier to migration. Offshore wind farm experience from the UK and Europe demonstrates that it is unlikely that collision risk mortalities will lead to a long-term decrease in the size of a population. A recent monitoring study by Tjørnløv et al. (2023) using radar to monitor seabird movements within an offshore wind farm in the UK even reported that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the two years of monitoring. However, collision risk and barrier effects need to be assessed based on local Australian species and populations. The level of impact associated with collision risks is uncertain; this will depend upon the relative abundance of bird species within the OWF Site, their utilisation of the OWF Site for migration and/or foraging, their typical flight heights and avoidance behaviours, and the size of individual populations.</p> <p><u>Seabirds</u></p> <p>Five Endangered seabird species may occur in the OWF Site, comprising three species of albatross and two species of petrel. Shy Albatross, Grey-headed Albatross and Northern Royal Albatross have all been assessed as having a high or moderate likelihood of occurrence in the OWF Site (Appendix C). Southern Giant Petrel and Gould's Petrel have been assessed as having a moderate likelihood of occurrence in the OWF Site (Appendix C). However, the likely utilisation of waters within the OWF Site and what numbers they might occur in is still uncertain for most species.</p> <p>There is potential for some foraging seabirds to be at risk of collision, although the listed Critically Endangered and Endangered species forage widely throughout the region and the OWF Site represents only a small part of this area. Shy Albatross, Grey-headed Albatross and Northern Royal Albatross forage over wide areas of the Southern Ocean, including the Bass Strait. A BIA for shy albatross foraging overlaps with the OWF Site and the whole of the South-east Marine Region. Southern Giant Petrel and Gould's Petrel are also understood to forage over wide areas of the region. When foraging, large seabirds such as albatrosses and petrels typically fly close to the surface of the water, therefore, they may often forage within the air gap beneath the turbine blades limiting the potential for collision. However, the behaviours of all these species require further investigation. It is also uncertain if different species may exhibit near-field avoidance of turbines.</p> <p>Reid et al. (2022) undertook an ecological risk assessment for the impacts of offshore wind farms on bird species in different regions of Australia. Relative risk scores were assigned for each species considering conservation status, reproduction rates, and susceptibility to impacts based on estimated flight heights,</p>	<p>Unlikely, noting there is potential for significant impact - but with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels.</p>

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>manoeuvrability, habitat specialisation. The Endangered seabird species identified in this assessment were assessed to be at relatively 'high risk' from offshore wind developments in the Bass Strait.</p> <p>Given the Endangered status of these seabird species and the uncertainties regarding their potential presence in the OWF Site, foraging behaviours and flight heights, impacts to these species are conservatively assessed as having the potential for significant impact. Further assessment, including baseline surveys to determine species presence and flight heights within the OWF Site, will be carried out to inform the impact assessment process.</p> <p><u>Shorebirds</u></p> <p>Two Critically Endangered shorebird species (Curlew Sandpiper and Eastern Curlew) and four Endangered shorebird species (Australian Painted Snipe and Lesser Sand Plover, Nunivak Bar-tailed Godwit, Common Greenshank) may occur within the OWF Site.</p> <p>Shorebird species have a preference for foraging on the shoreline or in coastal wetlands, rather than offshore in deep waters; the potential for impacts on these populations will largely depend on whether species migrate through the OWF Site. Most shorebirds migrate from the northern hemisphere or south-east Asia so their migration route to the Australian mainland is generally to/from the north of the OWF Site rather than through the OWF Site. Many species also fly at high altitudes on migration and reach high altitudes within a short distance from the coastline and therefore are not typically at risk of collision. Potential for these shorebird species to occur in the OWF Site will largely depend on whether they continue migration south from the Australian mainland to locations in the Bass Strait and Tasmania. Based on the likelihood of occurrence assessment (Appendix C) and SPRAT profiles for these species, Curlew Sandpiper and Eastern Curlew have a moderate likelihood of occurrence in the OWF Site due to their migration to and from Tasmania. Great Knot, Australian Painted Snipe and Lesser Sand Plover are less likely to pass through the OWF Site as they are less common in the cooler southern latitudes of Australia and are less likely to migrate to Tasmania in significant numbers.</p> <p>Shorebirds that fly south of locations such as Ninety Mile Beach, Corner Inset and Wilson's Promontory towards the Bass Strait and Tasmania have the potential to pass through the OWF Site, and their risk of collision will be assessed as part of the impact assessment process.</p> <p>The Critically Endangered and Endangered shorebird species identified in this assessment were all assessed by Reid et al. (2022) to be at relatively 'high risk' from offshore wind developments in the Bass Strait, with the exception of Great Knot (<i>Calidris tenuirostris</i>) which was assessed to be 'medium risk'. However, given shorebirds typically migrate at altitudes above turbine height, their risk from the OWF Site will be considered further during the impact assessment process. Given the Critically Endangered or Endangered status of these species and the uncertainties regarding their potential presence in the OWF Site and flight behaviours, impacts to these species are conservatively assessed as having the potential for significant impact. Further assessment, including baseline surveys to determine species presence and flight heights within the OWF Site, will be carried out to inform the impact assessment process.</p> <p><u>Migratory land birds</u></p>	

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>The Orange-bellied Parrot (<i>Neophema chrysogaster</i>) is listed as critically endangered under the EPBC Act and the FFG Act. It is also covered under provisions for marine species under the EPBC Act. The Orange-bellied Parrot (OBP) is a small (approx. 45g) ground-feeding parrot which breeds in south-west Tasmania and migrates to the coast of south-east mainland Australia for the non-breeding season. OBP nest in hollows of eucalypts that grow in copses in the button-grass plains that dominate coastal south-western Tasmania. Its primary habitat on the mainland is coastal saltmarsh and dune vegetation (DELWP 2016). Migration from Tasmania to the mainland occurs during autumn. The birds overwinter within a narrow zone along the coast, historically extending from eastern South Australia to southern NSW. In recent decades this has largely contracted to a few locations along the coast west of Port Phillip Bay. The migration back to Tasmania occurs in spring to summer.</p> <p>BirdLife (2020) discusses autumn migration and considers the potential for landfall in Victoria only between Cape Otway in the west and Lake Connewarre in the east. By comparison with the wide 'probable migration route' shown on the Recovery Plan map, this is a significantly smaller migration passage zone restricted to an area between the north of King Island and the coast of Victoria west of Port Phillip Bay. Thus, current knowledge indicates it is very unlikely that Orange bellied Parrots cross Bass Strait to the east of Port Phillip Bay, including through GEOW OWF Site.</p> <p>The OBP non-breeding range includes coastal habitat in South Australia, Victoria (including Corner Inlet) and to a lesser extent in southern New South Wales. Non-breeding habitat does not occur within the offshore Project Area but is adjacent to the Nearshore Cable Envelope, therefore, the species may occasionally overfly coastal waters. Noting that the main migration route for Orange-bellied Parrots is avoided, and the distance of the OWF from the coast, the likelihood of occurrence assessment determined there is a low likelihood of Orange-bellied Parrots being offshore in the OWF Site (Appendix C). Impacts to this species are therefore also unlikely.</p> <p>The Swift Parrot (<i>Lathamus discolor</i>) is listed as critically endangered under the EPBC Act 1999 and the FFG Act 1988. It is also covered under provisions for marine species under the EPBC Act. Swift Parrots breed in eastern, and to a lesser extent in north-western Tasmania during late spring and summer. The entire population migrates across Bass Strait in autumn to over-winter in the south-eastern mainland (Saunders and Tzaros 2011), dispersing throughout the eastern states of Australia. There is the potential for some individuals to migrate through the OWF Site (Appendix C) and be at risk of collision, however as Swift Parrots are understood to disperse over a broad area, their presence in the OWF Site is likely to be rare.</p> <p>Potential impacts are unlikely to lead to a long-term decrease in species populations. However, as their populations are small and there is some uncertainty regarding their migratory paths, they are conservatively assessed as having the potential for significant impact.</p> <p>The potential for cumulative effects from the Project and other proposed offshore wind farms in the Gippsland region on the above species has also been considered. Baseline bird surveys will be undertaken to better characterise the species that utilise the OWF Site at different times of year. This information and collision risk</p>	

Significant Impact Criteria	Assessment	Assessment Outcome
	modelling will be used to inform a detailed assessment of the potential impacts on seabird, shorebird, and migratory land bird populations.	
Reduce the area of occupancy of the species.	<p>The area of occupancy includes areas of available suitable breeding, migration, or foraging habitat within a species' broader extent of occurrence (i.e., range).</p> <p><u>Seabirds</u></p> <p>The listed Critically Endangered and Endangered seabird species forage widely throughout the region and the OWF Site represents only a small part of this area. The extent of occurrence for albatross and petrel species can extend to millions of square kilometres, given their regional, inter-continental or even circum-global distributions, and the area occupancy within these is also large. For example, the OWF Site overlaps with the foraging BIA for shy albatross, which extends over the whole of the South-east Marine Region and the species foraging range and area of occupation extends much further. The area that would be occupied by offshore turbines would be negligible by comparison and the OWF Site is not known to provide unique foraging habitat. Although the area of occupancy has not been quantified for all species, this preliminary assessment did not identify any species that would be considered as having a restricted range or area of occupancy overlapped by the OWF Site. A significant reduction in the area of occupancy of Critically Endangered and Endangered seabirds is not expected.</p> <p><u>Shorebirds</u></p> <p>The listed Critically Endangered and Endangered shorebirds have broad ranges within Australia and these species primarily occur along shorelines and coastal wetlands, though migration through the OWF Site may occur. The OWF Site represents a very small part of the area occupied by these species. A significant reduction in the area of occupancy of Critically Endangered and Endangered shorebirds is not expected.</p> <p><u>Migratory land birds</u></p> <p>The OBP is not expected to migrate through the OWF Site. The 'probable migration route' for Orange-bellied Parrots is located further west in the central Bass Strait) and the area of occupancy is unlikely to be reduced by the OWF Site. The OWF Site may include migration habitat for Swift Parrot but given its wide area of dispersion from Tasmania to the eastern states of Australia, the OWF Site is again considered to represent a small proportion of the species total area of occupancy. A significant reduction in total area of occupation is unlikely.</p> <p>The potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region is also acknowledged and will be considered as part of the EIA process. Baseline bird surveys will be undertaken to better characterise the species that occur in the OWF Site at different times of year. Survey methodologies for will be discussed with DCCEEW so that potential impacts on key species of interest can be adequately assessed. This information and collision risk modelling will be used to inform a detailed assessment of the potential impacts of collision and avoidance on populations.</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
Fragment an existing population into two or more populations.	It is unlikely that the Project would result in the fragmentation of an existing population into two or more populations. All listed species are known to be mobile and occur over large areas. The OWF Site is not located where it would present a complete barrier across a population's distribution or migration route.	Unlikely
Adversely affect habitat critical to the survival of a species.	<p><u>Seabirds</u></p> <p>The National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011-2016 (Commonwealth of Australia 2022m) defines breeding and foraging habitats critical for survival. No breeding colonies are located near to the project. The Recovery Plan describes all waters in Australian jurisdiction south of 25 degrees to be the most critical foraging habitat. BIAs are also defined for the species listed in Section 4.6.7.1. These foraging habitats cover the entire Bass Strait and, in many cases, the entire South-east Marine Region and Southern Ocean, reflecting how mobile the species are and how wide spread foraging is. Given the large extent of the areas identified relative to the OWF Site, impacts are unlikely to adversely affect habitat critical to the survival of albatrosses and petrels.</p> <p><u>Shorebirds</u></p> <p>According to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b), important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. The Conservation Plan does not define other areas as habitat critical to the survival of a species. As the Project activities in the OWF Site and cable envelopes are not expected to directly or indirectly impact important wetlands (refer to Section 5.3.3), the Project is not expected to adversely impact important habitats for shorebirds.</p> <p><u>Migratory land birds</u></p> <p>The National Recovery Plan for the Orange-bellied Parrot (Australian Government Department of the Environment 2016) notes that some mapping of habitat critical to the survival of orange-bellied parrots has been undertaken, including known breeding sites in Tasmania, optimal areas of saltmarsh and adjacent pastures on the mainland, and migratory habitat critical for survival on King Island. The OWF Site and cable envelopes avoid these habitats. Therefore, the Project is not expected to adversely affect any defined habitat critical to the survival of orange-bellied parrots.</p> <p>Baseline bird surveys will be undertaken to better characterise the species that occur in the OWF Site at different times of year. Survey methodologies will be discussed with DCCEE so that potential impacts on key species of interest can be adequately assessed. This information and collision risk modelling will be used to inform a detailed assessment of the potential impacts on populations.</p>	Unlikely
Disrupt the breeding cycle of a population.	<p>The OWF Site and cable envelopes do not overlap or occur near any breeding BIAs for Critically Endangered or Endangered birds.</p> <p><u>Seabirds</u></p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>The National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011-2016 identifies breeding habitat (habitat critical to the survival of albatrosses and giant petrels) in the Southern Ocean. Gould's Petrel are also known to breed off NSW and not in the Bass Strait. No breeding sites are located near the OWF Site. While collision of some transient, foraging seabirds in the OWF Site is possible over the operating life of the Project, impacts are not expected to be significant enough to disrupt breeding behaviours or breeding cycles of the broader populations.</p> <p><u>Shorebirds</u></p> <p>Migratory shorebirds that may breed at the coast and nearshore habitats (e.g., Corner Inlet and Gippsland Lakes Ramsar sites) migrate to Australia from south east Asia, and hence approach the wetlands from a northerly direction. They predominantly spend most of their time on coastal beaches, in wetlands and in coastal waters that may be adjacent to the Nearshore Cable Envelope. Some species may occur in the OWF Site, but impacts are unlikely to disrupt the breeding cycles of these species' populations.</p> <p><u>Migratory land birds</u></p> <p>Potential impacts on Orange-bellied Parrot and Swift Parrot populations are noted above, however, impacts on the actual breeding cycle of their respective populations is unlikely because breeding habitats only occur in Tasmania.</p> <p>Therefore, it is unlikely that the Project will disrupt the breeding cycle of an important population. However, the potential for cumulative effects from the Project and other offshore wind projects in the Gippsland region will be considered as part of the EIA process.</p>	
<p>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</p>	<p>As already noted above, habitat for Critically Endangered or Endangered birds may be significantly impacted as a result of the presence of operating offshore turbines within migration and foraging areas and there is the potential for collisions to occur.</p> <p>It is also noted that underwater noise may indirectly affect the abundance of prey fish species for seabirds in the vicinity of the OWF Site, particularly during construction activities, thereby decreasing the availability of foraging habitat for seabirds. However, such activities will be localised to the area of construction and are expected to represent a relatively small proportion of available foraging habitat. Any changes to prey behaviour located near to construction activities are expected to be small in the context of normal variability in the distribution and abundance of mobile fish species.</p> <p>The area represented by the OWF Site represents a very small area in relation to the wider distribution of the other listed species and it is unlikely that habitat will be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that the listed Critically Endangered or Endangered bird species are likely to decline. However, the potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p> <p>Baseline bird surveys will be undertaken to better characterise the species that occur in the OWF Site at different times of year. Survey methodologies will be discussed with DCCEE so that potential impacts on</p>	<p>Unlikely</p>

Significant Impact Criteria	Assessment	Assessment Outcome
	key species of interest can be adequately assessed. This information and collision risk modelling will be used to inform a detailed assessment of the potential impacts on populations.	
Result in invasive species that are harmful to a Critically Endangered or Endangered species becoming established in the Endangered or Critically Endangered species' habitat.	As noted previously, for an IMS to be harmful to a Critically Endangered or endangered species, it would need to survive transport to the region (e.g. in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	Unlikely
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment.	Unlikely
Interfere with the recovery of the species.	<p>Recovery plans and conservation advice for listed bird species identify marine pollution, invasive species, marine debris, human disturbance, habitat loss and degradation, barrier effects (offshore turbine collisions), artificial light, deterioration of water quality, and disturbance at nesting sites as key threatening processes for birds.</p> <p>Based on the identified aspects, effects and mitigation in Section 5.1, it is expected that most effects can be managed such that threats from marine debris, pollution, invasive species, water quality and human disturbance will not interfere substantially with any species.</p> <p>However, barrier effects (offshore turbine collisions) and habitat occupation are identified above as being threats where potentially significant impacts may occur. Noting that the potential for significant impacts on the size of a population of a species have been identified above, it is noted that the Project could also have some adverse effects on the recovery of Critically Endangered or Endangered species.</p> <p>Artificial lighting impacts require further assessment. Lighting on vessels during construction, maintenance and decommissioning will be limited to that required for safe operations. Lighting during operation will mainly comprise aviation obstruction lighting and marine navigational lighting on turbines. Noting that the OWF Site is located in an area of existing shipping traffic, fishing and other vessel activity, some lighting is already present in the area. Depending on the export cable route and shore crossing location, a detailed lighting management plan may be required to minimise impacts near significant bird habitats.</p>	Unlikely, noting there is potential for significant impact - but with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels.

Significant Impact Criteria	Assessment	Assessment Outcome
	Baseline surveys will be undertaken to better characterise the species that occur in the OWF Site at different times of year. Survey methodologies for will be discussed with DCCEEW so that potential impacts on key species of interest can be adequately assessed. This information and collision risk modelling will be used to inform a detailed assessment of the potential impacts on populations.	

5.3.3.2 VULNERABLE BIRD SPECIES

Vulnerable bird species relevant to the preliminary assessment are listed in **Table 5-6** and the assessment is presented in **Table 5-7**.

TABLE 5-7 VULNERABLE BIRD SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Seabirds	Shorebirds	Migratory Land Birds
Vulnerable	Southern Royal Albatross <i>Diomedea epomophora</i> ; Wandering Albatross <i>Diomedea exulans</i> ; Sooty Albatross <i>Phoebetria fusca</i> ; Buller's Albatross <i>Thalassarche bulleri</i> ; Indian Yellow-nosed Albatross <i>Thalassarche carteri</i> ; Antipodean Albatross <i>Diomedea antipodensis</i> ; Campbell Albatross <i>Thalassarche impavida</i> ; Black-browed Albatross <i>Thalassarche melanophris</i> ; Salvin's Albatross <i>Thalassarche salvini</i> ; White-capped Albatross <i>Thalassarche steadi</i> ; Northern Buller's Albatross <i>Thalassarche bulleri platei</i> ; Gibsons Albatross <i>Diomedea antipodensis gibsoni</i> ; Sooty Shearwater <i>Ardenna grisea</i> ; Northern Giant Petrel <i>Macronectes halli</i> ; White-bellied Storm-Petrel <i>Fregetta grallaria grallaria</i> ; Blue Petrel <i>Halobaena caerulea</i> ; Fairy Prion <i>Pachyptila turtur subantarctica</i> ; Australian Fairy Tern <i>Sternula nereis nereis</i> .	Greater Sand Plover <i>Charadrius leschenaultia</i> ; Eastern Hooded Plover <i>Thinornis cucullatus cucullatus</i> ; Red Knot <i>Calidris canutus</i> ; Sharp-tailed Sandpiper <i>Calidris acuminata</i> ; Latham's Snipe <i>Gallinago hardwickii</i> ;	White-throated Needletail <i>Hirundapus caudacutus</i>

TABLE 5-8 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE BIRD SPECIES

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population of a species.	<p>The key Project aspect considered relevant as part of this preliminary assessment as having potential for impacts on listed Threatened birds is 'Operating turbines – Barrier effects / collision risk'.</p> <p>Operating offshore turbines present a potential collision risk and barrier to migration. Offshore wind farm experience from the UK and Europe demonstrates that it is unlikely that collision risk mortalities will lead to a long-term decrease in the size of a population. A recent monitoring study by Tjørnløv et al. (2023) using radar to monitor seabird movements within an offshore wind farm in the UK even reported that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the two years of monitoring. However, collision risk and barrier effects need to be assessed based on local Australian species and populations. The level of impact associated with collision risks is uncertain; this will depend upon the relative abundance of bird species within the OWF Site, their utilisation of the OWF Site for migration and/or foraging, their typical flight heights and avoidance behaviours, and the size of individual populations.</p> <p><u>Seabirds</u></p> <p>Based on the PMST results, 18 seabird species listed as Vulnerable may occur in the OWF Site, comprising albatross and petrel, as well as Fairy Prion species. Reid et al. (2022) assessed all these species to be at relatively 'high risk' from offshore wind developments in the Bass Strait, except for Blue Petrel <i>Halobaena caerulea</i> which was assessed to be 'medium risk', and Northern Buller's Albatross <i>Thalassarche bulleri platei</i> and White-bellied Storm-Petrel <i>Fregetta grallari</i>, which Reid et al. 2022 did not assess. These species are also known to forage over a wide geographical region outside the OWF Site. Given uncertainties regarding the potential presence of the species in the OWF Site, foraging behaviours and flight heights, impacts to these Vulnerable species are conservatively assessed as having the potential for significant impact.</p> <p><u>Shorebirds</u></p> <p>Two listed Vulnerable species of shorebird species (Red Knot, Sharp-tailed Sandpiper) have the potential to occur in the OWF Site. Shorebird species have a preference for foraging on the shoreline, in coastal habitat or the intertidal zone, rather than offshore on deep waters; the potential for impacts on these populations will largely depend on whether species migrate through the OWF Site. Reid et al. (2022) assessed these species to be at relatively 'high risk' from offshore wind developments in the Bass Strait. However, it is important to note that many shorebird species are known to fly at high altitudes on migration and reach high altitudes within a short distance from the coastline and therefore are not typically at risk of collision. Their risk from the OWF Site will be considered further during the impact assessment process.</p> <p>Most shorebirds migrate from Siberia and south-east Asia so their migration route is generally to/from the north rather than through the OWF Site, but local movements of these species over coastal and offshore</p>	Potential for significant impact - but with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels.

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>waters may also occur. Some species are known to migrate onwards to Tasmania in some instances and individuals could pass within the OWF Site</p> <p>Given uncertainties regarding the potential presence of the species in the OWF Site and flight heights on migration, impacts to these Vulnerable species are conservatively assessed as having the potential for significant impact and their risk from the OWF Site will be considered further during the impact assessment process.</p> <p><u>Migratory land birds</u></p> <p>One listed Vulnerable migratory land bird species, White-throated Needletail, was identified as having the potential for some individuals to fly through the offshore Project Area during migration to Tasmania, although the likelihood of occurrence is assessed as low (Appendix C) and the number of individuals that may be impacted is likely to be small. Reid et al. (2022) did not identify the species to be at risk. Given the low likelihood of the species occurring in the OWF Site, no significant impact on the species is expected.</p> <p>The potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p> <p>Baseline bird surveys will be undertaken to better characterise the species that occur in the OWF Site at different times of year. Survey methodologies for will be discussed with DCCEEW so that potential impacts on key species of interest can be adequately assessed. This information and collision risk modelling will be used to inform a detailed assessment of the potential impacts on populations.</p>	
Reduce the area of occupancy of an important population.	<p>The bird species listed as Vulnerable are widely occurring throughout the region and the OWF Site is not identified as representing a significant area of occupancy for an important population.</p> <p>Baseline bird surveys will be undertaken to better characterise the species that utilise the OWF Site at different times of year to inform the assessment of potential impacts on seabird, shorebird and migratory land bird occupancy.</p>	Unlikely
Fragment an existing population into two or more populations.	<p>It is unlikely that the Project would result in the fragmentation of an existing population into two or more populations. All listed species are known to be mobile and occur over large areas. The OWF Site is not located where it would present a complete barrier across a population's distribution.</p>	Unlikely
Adversely affect habitat critical to the survival of a species.	<p>The National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011-2016 (Commonwealth of Australia 2022m) defines breeding and foraging habitats critical for survival. No breeding habitats are located near to the Project. The Recovery Plan describes all waters in Australian jurisdiction south of 25 degrees to be the most critical foraging habitat. BIAs are also defined for some of the Vulnerable species listed in Section 4.6.7.1. These foraging habitats cover the entire Bass Strait and in many cases the entire South-east Marine Region, reflecting how mobile the species are and how wide spread foraging is. Given the large extent of the areas identified relative to the OWF Site, impacts are unlikely to adversely affect habitat critical to the survival</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>of Threatened albatrosses and giant petrels. However, the potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p> <p>The cable envelopes does not overlap with habitat critical to the survival of any Vulnerable birds.</p> <p>Baseline bird surveys will be undertaken to better characterise the species that utilise the OWF Site and the Project is exploring opportunities to support or enhance ongoing research into local seabird species.</p>	
Disrupt the breeding cycle of an important population.	<p>The OWF Site and cable envelopes do not overlap or occur near any breeding BIAs for Vulnerable birds. The National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011-2016 identifies breeding habitat (habitat critical to the survival of albatrosses and giant petrels) in the Southern Ocean. No breeding site as are located near the OWF Site. Fairy Prion (<i>Pachyptila turtur subantarctica</i>) breed only on Macquarie Island and a number of other sub-Antarctic islands outside of Australia waters, though some individuals may migrate towards New Zealand and southern Australia in winter. It is noted that the other subspecies of Fairy Prion (<i>P. t. turtur</i>) breeds in New Zealand, offshore islands in the Bass Strait (including Seal Island, Notch Island, Rag Island and Clifly Island near the OWF Site) and the Falkland Islands; however, the subspecies has a population of several million pairs and is not listed as Vulnerable (DAWE, 2022b). While collision of some transient, foraging seabirds in the OWF Site is possible over the operating life of the Project, impacts are not expected to be significant enough to disrupt the breeding behaviours and cycles of the broader population.</p> <p>Migratory shorebirds that may breed at the coast (e.g., Corner Inlet Ramsar site and surrounding wetlands) migrate from the northern hemisphere and southeast Asia. They predominantly spend most of their time on coastal beaches, in wetlands and in coastal waters. Some may occur in the OWF Site, but impacts are unlikely to disrupt the breeding cycles of these species' populations.</p> <p>Therefore, it is unlikely that the Project will disrupt the breeding cycle of a population. Notwithstanding this, the potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p>	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The OWF Site and cable envelopes are not known to occur in area of unique habitat for Vulnerable bird species. Some level of foraging is expected to occur in the OWF Site and cable envelopes.</p> <p>Underwater noise may affect the abundance of prey fish species within the OWF Site, particularly during construction activities. However, such activities will be localised to the area of construction and are expected to represent a relatively small proportion of available foraging habitat. Any changes to prey behaviour located near to construction activities are expected to be small in the context of normal variability in the distribution and abundance of mobile fish species.</p> <p>Foraging will also be limited within the OWF Site during operations due to the presence of operating offshore turbines. Whilst bird foraging BIAs overlap the OWF Site, this area represented by the OWF Site represents a very small area in relation to the wider distribution of the other listed species and it is unlikely that habitat will be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>that the listed Vulnerable bird species are likely to decline. However, the potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p> <p>In the unlikely event of fuel/chemical spills, it is possible the released hydrocarbons or chemicals could reduce the quality of available habitat. However, with the preventative and mitigative controls outlined in Section 5.1, it is highly unlikely that such a major incident and subsequent impacts will occur.</p>	
Result in invasive species that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat.	For an IMS to be harmful to a Vulnerable species, it would need to survive transport to the region (e.g., in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	Unlikely
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment.	Unlikely
Interfere substantially with the recovery of the species.	<p>Recovery plans and conservation advice for listed bird species identify marine pollution, invasive species, marine debris, human disturbance, habitat loss and degradation, barrier effects (offshore turbine collisions), artificial lighting, deterioration of water quality, and disturbance at nesting sites as key threatening processes for birds.</p> <p>Based on the identified aspects, effects and mitigation in Section 5.1, it is expected that most project effects can be managed such that threats such as marine debris, pollution, invasive species, water quality and human disturbance will not interfere substantially with any species.</p> <p>However, collision risk, barrier effects and habitat displacement are identified above as being threats where potentially significant impacts may occur, however with appropriate management and mitigation these risks are likely to be reduced to an acceptable level. Noting that the potential for significant impacts on the size of a population of a species is identified above, it is noted that the Project could have some adverse effect on the recovery of Vulnerable species. Current understanding of Vulnerable species relevant to the Project and the absence of unique or critical habitat for those species indicates that any adverse impacts are unlikely to interfere substantially with the recovery of a species.</p> <p>Artificial lighting impacts require further assessment. Lighting on vessels during construction, maintenance and decommissioning will be limited to that required for safe operations. Lighting during operation will mainly comprise aviation obstruction lighting and marine navigational lighting on turbines. Noting that the OWF Site is</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>located in an area of existing shipping traffic, fishing and other vessel activity, some lighting is already present in the area. Depending on the export cable route and shore crossing location, a detailed lighting management plan may be required to minimise impacts near significant bird habitats.</p> <p>Baseline bird surveys will be undertaken to better characterise the species that utilise the OWF Site and collision risk modelling will need to be undertaken as part of the more detailed EIA in order to better understand the magnitude of such impacts on different species populations.</p>	

5.3.3.3 CRITICALLY ENDANGERED AND ENDANGERED MARINE MAMMAL SPECIES

Critically Endangered and Endangered marine mammal species relevant to the preliminary assessment are listed in **Table 5-8** and the assessment is presented in **Table 5-9**.

TABLE 5-9 CRITICALLY ENDANGERED AND ENDANGERED MARINE MAMMAL SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Cetaceans	Pinnipeds
Critically Endangered	None	None
Endangered	Pygmy blue whale <i>Balaenoptera musculus brevicauda</i> Southern right whale <i>Eubalaena australis</i>	None

TABLE 5-10 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: CRITICALLY ENDANGERED AND ENDANGERED MARINE MAMMALS

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Critically Endangered or Endangered species if there is a real chance or possibility that it will:		
<p>Lead to a long-term decrease in the size of a population</p> <p>and</p> <p>Reduce the area of occupancy of the species</p>	<p>Two Endangered marine mammal species, pygmy blue whale and southern right whale, have the potential to occur in the OWF Site and the cable envelopes. Of the various Project aspects and effects identified in in Section 5.1, underwater noise and vibration was considered as part of the assessment as having the potential to impact the populations and areas of occupancy of these species.</p> <p>High magnitude impulsive sound from foundation installation and other noise produced by other construction / decommissioning activities and vessel thrusters has the potential for a range of effects ranging from behavioural effects, through to auditory impairment (Permanent Threshold Shift [PTS] and Temporary Threshold Shift [TTS]) or injury where animals are exposed at close range or extended periods of time. Use of bubble curtains (for piling) and implementation of observation and shutdown zones, soft-start procedures and shutdown procedures reduce the risk of auditory impairment or injury, but behavioural effects and temporary hearing impairment (temporary threshold shift) are still possible. However, these effects are unlikely to lead to a long-term decrease in the size of populations.</p> <p>The potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region is also acknowledged and will be considered as part of the EIA process.</p> <p><u>Blue whales / pygmy blue whales</u></p> <p>Blue whales and pygmy blue whales are seasonal visitors to the region and may be present from approximately November through to May. The OWF Site overlaps a BIA for likely foraging for pygmy blue whales, which includes the majority of the Bass Strait and coastal waters of Tasmania. However, the main feeding areas for the species are located near the Kangaroo Island Upwelling off South Australia and the Bonney Upwelling to the west of Cape Otway, where BIAs for foraging (annual high use areas) are defined. The annual high use areas are located over 300 km west of the OWF Site and so no impacts are expected in these areas. Noting that the OWF Site is located within a potential foraging area, few records for the species exist in the Gippsland region on the Atlas of Living Australia. The potential for foraging is acknowledged but based on limited records the OWF Site and surrounding waters is not expected to be in a high use foraging area for the species based on the limited number of sightings that occur.</p> <p>The Conservation Management Plan for the Blue Whale (Commonwealth of Australia 2015c) sets out specific requirements under Action Area A.2, specifically that <i>anthropogenic noise in biologically important areas will be managed such that any blue whale continues to utilise the area without injury,</i></p>	<p>Unlikely, for long term decrease in the size of a population</p> <p>Potential for significant impact - but with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels, in accordance with recovery plans for the relevant species.</p>

Significant Impact Criteria	Assessment	Assessment Outcome
	<p><i>and is not displaced from a foraging area.</i> Associated Guidance on key terms within the Blue Whale Conservation Management Plan (CMP) (published by DAWE in 2021) clarifies that:</p> <ul style="list-style-type: none"> • A precautionary approach should be taken to the management of industry activities proposed to occur in or adjacent to designated BIAs (Foraging Areas) due to the increased likelihood of whales foraging in those locations at critically important times. • For the purpose of interpreting and applying Action Area A.2 of the Blue Whale CMP, injury is both permanent and temporary hearing impairment (PTS and TTS) and any other form of physical harm arising from anthropogenic sources of underwater noise. • A whale is considered to be 'displaced' from a Foraging Area if foraging behaviour is disrupted, regardless of whether the whale can continue to forage elsewhere within that Foraging Area. Mitigation measures must be implemented to reduce the risk of displacement occurring during operations where modelling indicates that behavioural disturbance within a Foraging Area may occur. <p>There may be the potential for behavioural effects and TTS effects to occur during foundation installation and other construction / decommissioning activities (e.g. vessels operating dynamic positioning systems and thrusters for extended periods of time). Some individuals or small groups of whales may be affected, but this is not expected to impact their survival or result in a long-term decrease in the size of a population. Relative to their broader distribution in the region and greater abundance and more viable foraging grounds to the west of Cape Otway, the potential effects are likely to be minor.</p> <p>However, considering the above policy position of the Blue Whale CMP, potential disturbance of pygmy blue whales within the foraging BIA will potentially constitute 'displacement'. There is also the potential to temporarily reduce the area of occupancy of the species within the BIA during construction / decommissioning.</p> <p>Operational noise is unlikely to have significant effects to cetaceans over large distances, although behavioural effects from noise associated with maintenance vessels and operating turbines is possible. Further assessment of noise levels and ranges is required to understand the extent of effects and the potential for the OWF Site to reduce available habitat / area of occupancy long term. However, given relatively low sound levels, this is considered unlikely.</p> <p>Baseline marine fauna surveys are currently underway to further characterise the level of use within and surrounding the OWF Site and acoustic modelling will inform the assessment of potential impacts of underwater noise.</p> <p><u>Southern Right Whales</u></p> <p>Southern Right Whales may occur in the OWF Site and cable envelopes between approximately April to November. Southern Right Whale BIAs were updated in August 2023, including a large expansion of the Migration BIA, which now overlaps the entire OWF Site and cable envelopes. Southern Right Whale</p>	

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>migrate through this area from April to October, although numbers are likely to be low due to the small subpopulation size. The updated Reproduction BIA includes all state waters out to 2.5 km from shore, with reproduction BIAs across the species range considered habitat critical to the survival of the species (DCCEEW 2024). Southern Right Whales use this area for breeding, calving and aggregation from May to September. Although coastal waters adjacent to the OWF Site and within the Nearshore Cable Envelope do not represent an established aggregation area for breeding or calving, increasing numbers of sightings have occurred along the Gippsland coast (east from Wilsons Promontory) in recent years (DCCEEW 2024) with mother-calf pairs observed migrating and resting in these waters and mating behaviour reported. However, the main established southern right whale breeding / calving / aggregation area for Southern Right Whales in Victoria is located near Warrnambool, approximately 360 km west of the OWF Site.</p> <p>The National Recovery Plan for the Southern Right Whale (DCCEEW 2024) sets out requirements under Action Area A2, specifically that <i>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</i>. Action Area A5 also requires <i>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... and that risk of behavioural disturbance is minimised</i>.</p> <p>Potential behavioural and TTS effects may occur due to construction / decommissioning (primarily from foundation installation and vessel thrusters). This is not expected to impact survival or result in a long-term decrease in the size of a population; however, disturbance may result in a temporarily reduced area of occupancy for the species within the Migration BIA when seasonally present. No activities will be undertaken that are inconsistent with a Recovery Plan (EPBC Act) or Action Statement (FFG Act) for threatened whale species. A range of control options will be considered to prevent disturbance to Southern Right Whale habitat during the breeding and calving season (May-September). These could include scheduling of activities, use of bubble curtains for foundation installation activities, increased monitoring and use of marine mammal observers, observation zones and DP shut-down procedures, and limits on vessel speeds. An adaptive management plan will be developed and informed by underwater noise modelling of vessel thrusters to determine effects distances, along with in-field monitoring for whales during construction activities.</p> <p>Operational noise is unlikely to have significant effects to cetaceans over large distances, although behavioural effects from noise associated with maintenance vessels and operating turbines is possible. Further assessment of noise levels and ranges is required to understand the extent of effects and the potential for the OWF Site to reduce available habitat / area of occupancy long term. However, given relatively low sound levels, this is considered unlikely.</p>	

Significant Impact Criteria	Assessment	Assessment Outcome
	Baseline marine fauna surveys are currently underway to characterise the level of use within and surrounding the OWF Site and acoustic modelling will inform the assessment of potential impacts of underwater noise. Results will inform the requirement for additional mitigation to reduce impacts on Blue Whales / Pygmy Blue Whales and Southern Right Whales.	
Fragment an existing population into two or more populations.	<p>It is highly unlikely that the Project will fragment the blue whale / pygmy blue whale or southern right whale population into two or more populations. Both species are highly mobile and have large ranges. Construction noise will be temporary and adaptive management mitigation and a range of other control options will be considered to prevent displacement or a barrier to migration through the OWF Site and surrounding waters.</p> <p>The physical presence of the operational wind farm and associated disturbance is not expected to be significant enough to result in fragmentation of the population.</p> <p>EMF produced by the inter-array cables and export cables has also been considered for its potential to interfere with the navigation and migration of cetaceans given that they are understood to perceive and orient to local distortions in the earth's magnetic field, among other cues. However, inter-array cables and export cables are likely to be AC, and EMF fields associated with AC frequencies are usually undetectable to most marine fauna beyond a few metres from the cable, with most species more sensitive to DC than AC EMFs (Normandeau et al. 2011). Published studies have generally found that marine migratory species may sense EMF but they do not pose a physical barrier, and that species will navigate around or above the EMF source in the water column (Kavet et al. 2016; Hutchison et al. 2018). Cable EMFs are therefore, expected to have limited effect to cetaceans during migration.</p>	Unlikely
Adversely affect habitat critical to the survival of a species.	<p>No habitat critical to the survival of blue whales / pygmy blue whales has been identified or designated by DCCEEW.</p> <p>The annual high use foraging areas for pygmy blue whales are located approximately 300 km west of the OWF Site.</p> <p>Therefore, no significant impacts to habitat critical to the survival of the blue whale is expected.</p> <p>The Southern Right Whale Reproduction BIA includes all state waters out to 2.5 km from shore, with this area considered habitat critical to the survival of the species. The area overlaps the Nearshore Cable Envelope, where the main impacts will be temporary and restricted to installation, maintenance and decommissioning of the export cable.</p> <p>Potential behavioural and TTS effects may occur due to construction / decommissioning of the OWF (primarily from foundation installation and vessel thrusters). Injury/impairment of whales in the</p>	Unlikely, noting there is potential for significant impact - but with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels.

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>Reproduction BIA is unlikely to occur given the use of bubble curtains for piling and implementation of management control measures at the OWF Site, which is 23 km from the closest BIA waters, and during cable installation activities. Behavioural disturbance to foraging or migration activities may occur to some animals, although the area of disturbance or displacement is likely to be small relative to wider habitat and distribution and the broader population. Migrating animals may avoid the area but this would not impede their migration to or from important coastal habitat. Further assessment of noise levels and ranges is required to understand the extent of effects and the potential for adverse impacts on habitat critical to the survival of Southern Right Whales.</p> <p>Baseline marine fauna surveys are currently underway to characterise the level of use within and surrounding the OWF Site and acoustic modelling will inform the assessment of potential impacts of underwater noise. Results will inform the requirement for additional mitigation to reduce impacts on southern right whales.</p>	
Disrupt the breeding cycle of a population.	<p>Breeding and or calving of blue whales / pygmy blue whales is not known to occur near the OWF Site or cable envelopes. The primary established southern right whale breeding / calving / aggregation BIA is located near Warrnambool, approximately 360 km west of the OWF Site. However, mating behaviour has been reported from the Wilson's Promontory area. mother-calf pairs of southern right whales may migrate and rest in coastal waters. There is the potential that disturbance could separate some individuals or disturb mating behaviours if activities are unmitigated. However, adaptive management mitigation and a range of other control options will be considered to prevent disruption during the breeding and calving season (May-September). Disruption to the breeding cycle of the population is therefore unlikely.</p>	Unlikely, noting there is potential for significant impact - but with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>As noted above:</p> <ul style="list-style-type: none"> There is the potential that underwater noise from the project to temporarily disturb or displace groups or individuals of blue whales / pygmy blue whales and southern right whales. The physical presence of the OWF may also represent modification and reduction in habitat, although the extent of these changes is negligible in the context of the broader distributions and habitat utilisation of the two species. The nearest habitat utilised for reproduction by Southern Right Whales is 23 km from the OWF Site and is not expected to be affected by its physical presence. 	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<ul style="list-style-type: none"> EMF produced by the inter-array cables and export cables is unlikely to pose a physical barrier to migration and EMF fields associated with AC frequencies are usually undetectable to most marine fauna beyond a few metres from the cable. <p>It is unlikely that habitat will be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that these species are likely to decline.</p>	
Result in invasive species that are harmful to a Critically Endangered or Endangered species becoming established in the Endangered or Critically Endangered species' habitat.	For an IMS to be harmful to a Critically Endangered or Endangered species, it would need to survive transport to the region (e.g., in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	Unlikely
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment.	Unlikely
Interfere with the recovery of the species.	<p>The Conservation Management Plan for the Blue Whale (Commonwealth of Australia 2015c) and the National Recovery Plan for the Southern Right Whale (DCCEEW 2024) both identify noise interference, habitat modification, and vessel disturbance (collisions) as key threats to the population.</p> <p>Noise interference has been identified above as having the potential for disturbance / displacement to small groups or individual whales during the construction phase, which could in turn result in the temporary reduction of area of occupancy of the species within the BIA during construction / decommissioning. However, these localised disturbances are likely to be small in the context of the broader distributions and habitat utilisation of the two species.</p> <p>The physical presence of the OWF may represent modification, although the extent of these changes is negligible in the context of the broader distributions and habitat utilisation of the two species. The CMPs also consider marine debris and chemical discharges in terms of habitat modification. Routine discharges</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>are expected to have only localised impacts and the Project is located close to an area of existing shipping traffic. With the implementation of control measures identified in Section 5.1, it is unlikely the extent of habitat modification will interfere with either species' recovery.</p> <p>Vessel disturbance (collisions) is also unlikely to interfere with the recovery of either species, given the application of EPBC Regulations 2000, Part 8, Division 8.1 for vessel speeds and approach distances for marine mammals.</p>	

5.3.3.4 VULNERABLE MARINE MAMMAL SPECIES

Vulnerable marine mammal species relevant to the preliminary assessment are listed in **Table 5-10** and the assessment is presented in **Table 5-11**.

TABLE 5-11 VULNERABLE MARINE MAMMAL SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Cetaceans	Pinnipeds
Vulnerable	Sei whale <i>Balaenoptera borealis</i> Fin whale <i>Balaenoptera physalus</i>	None

TABLE 5-12 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE MARINE MAMMALS

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population of a species.	<p>Sei whales are known to occur in waters of the western Bass Strait where opportunistic feeding has been observed. The number of recorded sightings is relatively low indicating that the species is not common in the Bass Strait.</p> <p>Fin whales are also infrequent visitors to the Bass Strait. A limited number of sightings suggests that fin whales may migrate through the OWF Site and Offshore Cable Envelope, and possibly feed in the region, although numbers are likely to be low.</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	Potential disturbance to these species from underwater noise is, therefore, expected to be limited to occasional isolated individuals. No BIAs are defined for either species. Localised areas of behavioural disturbance are not expected to result in a long-term decrease in the size of a population.	
Reduce the area of occupancy of an important population.	Given both sei whales and fin whales have wide distributions throughout the southern hemisphere, the species are infrequent visitors in the Bass Strait, and there are no BIAs in the region, disturbances to these species are not likely to change to the area of occupancy.	Unlikely
Fragment an existing population into two or more populations.	It is unlikely that the Project would result in the fragmentation of an existing population into two or more populations. All listed Vulnerable species are known to be mobile and occur over large areas. The OWF Site is not located where underwater noise or the physical presence of the OWF would present a barrier across a population's distribution. EMF produced by the inter-array cables and export cables is unlikely to pose a physical barrier to migration and EMF fields associated with AC frequencies are usually undetectable to most marine fauna beyond a few metres from the cable.	Unlikely
Adversely affect habitat critical to the survival of a species.	No habitat critical is defined for sei whales or fin whales.	No
Disrupt the breeding cycle of an important population.	There are no known BIAs for sei or fin whales in Australia and no known mating or calving areas have been defined. Given the relatively low number of sightings that have occurred in the Bass Strait, breeding is not expected to occur here.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Given both sei whales and fin whales have wide distributions throughout the southern hemisphere, the species are infrequent visitors in the Bass Strait, and there are no BIAs in the region, it is unlikely that habitat will be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that the species are likely to decline.	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
Result in invasive species that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat.	For an IMS to be harmful to a Vulnerable species, it would need to survive transport to the region (e.g. in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	Unlikely
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment.	Unlikely
Interfere substantially with the recovery of the species.	There are no adopted Recovery Plans for sei whale or fin whale that set our recovery objectives for the species. Given both sei whales and fin whales have wide distributions throughout the southern hemisphere, the species are infrequent visitors in the Bass Strait, and the absence of BIAs, impacts on small numbers of individuals are not expected to interfere substantially with the recovery of the species.	Unlikely

5.3.3.5 CRITICALLY ENDANGERED AND ENDANGERED TURTLE SPECIES

Critically Endangered and Endangered turtle species relevant to the preliminary assessment are listed in **Table 5-12** and the assessment is presented in **Table 5-13**.

TABLE 5-13 CRITICALLY ENDANGERED AND ENDANGERED TURTLE SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Marine Turtles
Critically Endangered	None
Endangered	<ul style="list-style-type: none">• Loggerhead Turtle <i>Caretta caretta</i>• Leatherback Turtle <i>Dermochelys coriacea</i>

TABLE 5-14 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: CRITICALLY ENDANGERED AND ENDANGERED TURTLE SPECIES

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Critically Endangered or Endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	<p>Loggerhead turtles typically have a tropical distribution and are uncommon in waters off Victoria (Commonwealth of Australia 2017). Therefore, no impacts on the population are expected.</p> <p>The northern Bass Strait is a significant feeding ground for leatherback turtles and has been identified as one of the three largest concentrations of feeding leatherback turtles in Australia (Department of Sustainability and Environment, 2009). This area is located a significant distance from the OWF Site and cable envelopes, and the Project is therefore unlikely to affect feeding aggregations. In the Bass Strait, leatherback turtles may congregate in areas where southward flowing warm currents converge with steep bathymetric contours, presumably because food is more readily available in these areas. Most sightings occur between January and May (Department of Sustainability and Environment, 2009).</p> <p>Underwater noise from construction (e.g., foundation installation) and decommissioning may result in localised behavioural responses. The use of bubble curtains, soft start procedures for foundation installation will limit the risk of injury and additional mitigation (e.g. turtle shut down procedures) will also be considered during the EIA phase, and incorporated into subsequent management plans to further reduce the likelihood of impacts. Short term disturbances to individuals or groups of leatherback turtles in the vicinity of construction activities</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>are not expected to result in a long-term decrease in the size of the east coast population that visits the Bass Strait.</p> <p>The physical presence of the built OWF is not expected to significantly modify habitat or behaviours to the degree that it impacts leatherback turtles foraging behaviours or their distribution in the Bass Strait.</p>	
Reduce the area of occupancy of the species.	<p>Short term disturbances to individuals or groups of leatherback turtles in the vicinity of construction activities are not expected to result significant impacts on the population or broader distribution of foraging activities (i.e., no large-scale displacement of turtles from the area is expected).</p> <p>The physical presence of the operational OWF is not expected to significantly modify habitat or behaviours to the degree that it impacts leatherback turtles foraging behaviours or their distribution in the Bass Strait.</p> <p>Therefore, the Project is not expected to reduce the area of occupancy of the species.</p>	Unlikely
Fragment an existing population into two or more populations.	<p>It is highly unlikely that the Project will fragment the leatherback turtle population.</p> <p>Short term disturbances to individuals or groups of leatherback turtles in the vicinity of construction activities are not expected to result in a long-term decrease in the size of the east coast population that visits the Bass Strait.</p> <p>The physical presence of the built OWF is not expected to significantly modify habitat or behaviours to the degree that it impacts leatherback turtles foraging behaviours or their distribution in the Bass Strait.</p>	Unlikely
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of marine turtles is identified in the Bass Strait.	No
Disrupt the breeding cycle of a population.	Leatherback turtles and loggerhead turtles both breed and nest in the tropics, not in the Bass Strait. Juvenile leatherback turtles also do not venture to the temperate waters of the Bass Strait (Department of Sustainability and Environment, 2009). Therefore, Project activities will not disrupt the breeding cycles of these populations.	No
Modify, destroy, remove, isolate or decrease the	Construction / decommissioning activities and the physical presence of the operating OWF is not expected to significantly modify habitat or behaviours of marine turtles in the Bass Strait.	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
availability or quality of habitat to the extent that the species is likely to decline.	<p>Artificial lighting impacts will require further assessment. Lighting on vessels during construction, maintenance and decommissioning will be limited to that required for safe operations. Lighting during operation will mainly comprise aviation obstruction lighting and marine navigational lighting on turbines. Noting that the OWF Site is situated in an area of existing shipping traffic, fishing and other vessel activity, some lighting is already present in the area. Artificial lighting is of greatest risk to turtles near nesting sites where it can disorientate turtle hatchlings; no turtle nesting or hatchling activity occurs in the Bass Strait so light effects are limited to potential attraction of prey and adult turtles near vessels during construction, maintenance and decommissioning. Impacts on turtles in terms of fitness and survival are unlikely to be significant.</p> <p>It is unlikely that habitat will be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that these species are likely to decline.</p>	
Result in invasive species that are harmful to a Critically Endangered or Endangered species becoming established in the Endangered or Critically Endangered species' habitat.	For an IMS to be harmful to a Critically Endangered or Endangered species, it would need to survive transport to the region (e.g., in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	No
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment.	No
Interfere with the recovery of the species.	<p>The Recovery Plan for Marine Turtles in Australia (Commonwealth of Australia 2017) lists the following threats to marine turtles that are potentially relevant to aspects of the Project:</p> <ul style="list-style-type: none"> • Marine debris – Marine debris from the Project is not expected to be significant if waste and dropped objects are managed in accordance with standard control measures identified in Section 5.1. • Chemical discharges – Routine vessel discharges and localised, slight changes in water quality are not expected to pose a significant risk to marine turtles if managed in accordance with standard control 	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>measures identified in Section 5.1. Unplanned fuel / chemical spills are also unlikely to occur given the proposed measures in Section 5.1.</p> <ul style="list-style-type: none">• Light pollution – Noting that the OWF Site is situated in an area of moderate shipping traffic, fishing and other vessel activity, some lighting is already present in the area. Artificial lighting is of greatest risk to turtles near nesting sites where it can disorientate turtle hatchlings; no turtle nesting or hatchling activity occurs in the Bass Strait so light effects are limited to potential attraction of prey and adult turtles near vessels during construction, maintenance and decommissioning. Impacts on turtle foraging in terms of fitness and survival are unlikely to be significant. As per Section 5.1, lighting on vessels during construction, maintenance and decommissioning will be limited to that required for safe operations.• Habitat modification – The presence of turbine foundations and other artificial structures may locally alter fish communities but is not expected to materially alter foraging habitat or the availability of prey for turtles.• Vessel disturbance (collision) – Slow moving or stationary vessels during construction limit the risk to turtles.• Noise interference – As noted above, short term disturbances to individuals or groups of leatherback turtles in the vicinity of construction activities are not expected to result significant impacts on the population or broader distribution of foraging activities (i.e., no large scale displacement of turtles from the area is expected).• Diseases and pathogens – With the control measures and compliance with biosecurity legislation outlined in Section 5.1, it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment. <p>Based on this review of relevant aspects and threats, the Project is unlikely to interfere with the recovery of marine turtle populations.</p>	

5.3.3.6 VULNERABLE TURTLE SPECIES

Vulnerable turtle species relevant to the preliminary assessment are listed in **Table 5-14** and the assessment is presented in **Table 5-16**.

TABLE 5-15 VULNERABLE TURTLE SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Marine Turtles
Vulnerable	Green Turtle <i>Chelonia mydas</i>

TABLE 5-16 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE TURTLE SPECIES

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population of a species.	Green turtles are uncommon in waters off Victoria and only individuals occasionally stray into temperate waters (Commonwealth of Australia 2017). No significant habitat exists in the Bass Strait for the species. Therefore, no population level impacts are expected.	No
Reduce the area of occupancy of an important population.	Green turtles are uncommon in waters off Victoria and only individuals occasionally stray into temperate waters (Commonwealth of Australia 2017). No significant habitat or important population exists in the Bass Strait for the species.	No
Fragment an existing population into two or more populations.	Given that only individuals occasionally stray into the temperate waters of the Bass Strait, there is no established population in the Bass Strait. Fragmentation of the population is not considered to be likely	No
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of marine turtles is identified in the Bass Strait.	No
Disrupt the breeding cycle of an important population.	Green turtles breed and nest in the tropics, not in temperate environs such as Bass Strait. Therefore, Project activities will not disrupt the breeding cycles of these populations.	No
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Green turtles are uncommon in waters off Victoria and only individuals occasionally stray into temperate waters (Commonwealth of Australia 2017). No significant habitat exists in the Bass Strait for the species. Therefore, habitat for the species will not be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that these species are likely to decline.	No
Result in invasive species that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat.	For an IMS to be harmful to a Critically Endangered or Endangered species, it would need to survive transport to the region (e.g., in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established. Further, there is no established green turtle population in the Bass Strait that may be impacted.	No

Significant Impact Criteria	Assessment	Assessment Outcome
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment. Further, there is no established green turtle population in the Bass Strait that may be impacted.	No
Interfere substantially with the recovery of the species.	Given that only individuals occasionally stray into the temperate waters of the Bass Strait, there is no established population in the Bass Strait. Impacts on individuals may occur very infrequently or not at all. Therefore, the project will not interfere substantially with the recovery of the species.	No

5.3.3.7 CRITICALLY ENDANGERED AND ENDANGERED FISH SPECIES

No potential for significant impact.

No EPBC Act listed Critically Endangered or Endangered fish species are predicted to occur in the OWF Site or cable envelopes.

5.3.3.8 VULNERABLE FISH SPECIES

Vulnerable fish species relevant to the preliminary assessment are listed in **Table 5-16** and the assessment is presented in **Table 5-18**.

TABLE 5-17 VULNERABLE FISH SPECIES RELEVANT TO THE ASSESSMENT

EPBC Threatened Status	Fish
Vulnerable	<ul style="list-style-type: none">• White Shark <i>Carcharodon carcharias</i>• Australian Grayling <i>Prototroctes maraena</i>• Whale Shark <i>Rhincodon typus</i>

TABLE 5-18 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: VULNERABLE FISH SPECIES

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population of a species.	<p>Three Vulnerable fish species, white shark, Australian grayling and whale shark, have the potential to occur in the OWF Site and the cable envelopes.</p> <p>The white shark is widely distributed, in the temperate waters of Australia. Breeding (nursery) BIAs extend from Wilsons Promontory to Lakes Entrance and overlaps the OWF Site and cable envelopes. Distribution BIAs also overlap both the OWF Site and cable envelopes.</p> <p>The Australian grayling spends most of its life in freshwater streams and brackish coastal lagoons. The stage that is spent in coastal waters is the newly hatched larval stage when they drift downstream and out into coastal waters, where they remain for approximately six months before juveniles migrate back into fresh water.</p> <p>Whale sharks are predominantly found in the tropical northern waters of Australia and the OWF Site and cable envelopes are located in the whale shark's southernmost distribution. The species is unlikely to occur/may occur infrequently in these waters. Therefore, any effects to individuals of this species would not have a significant impact on the population of the species.</p> <p>The key Project aspects and effects identified as relevant to listed Vulnerable fish species are:</p> <ul style="list-style-type: none"> • Underwater noise and vibration • EMF • Seabed disturbance and artificial habitat creation. <p>The potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p> <p>Underwater noise and vibration</p> <p>Sharks belong to a group of fishes that lack a swim bladder and are, therefore, insensitive to changes in sound pressure in the water column. Sharks are, however, able to detect vibrations and acoustic particle motion component of sound at relatively close range (Popper et al. 2014). Sound exposure guidelines published by Popper et al. (2014) indicate that injury and impairment effects would be limited to close range while significant behavioural effects are likely to be limited to tens or hundreds of metres from the foundation installation activities. Soft-start mitigation is likely to allow sharks to avoid the immediate area and prevent injury from occurring. Localised behavioural effects are expected to have limited impacts on the survival of individuals, or the population given that white sharks are highly vagrant, moving and foraging over large areas. For example, a study in the Bass Strait that looked at the movements of tagged sharks exposed to sound during a seismic survey, reported that sharks moved freely in and out of the study area and exposed sharks did not show any indication of differences in behaviour or distribution compared with control areas (Bruce et al. 2018). Localised behavioural effects from underwater noise are not expected to result in a long-term decrease in the size of the</p>	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>population although some effects on the distribution of juvenile sharks within the nursery BIA will be considered as part of the EIA process.</p> <p>Underwater noise and vibration may also have limited impacts on grayling larvae. Larvae will disperse widely in coastal waters. Sound exposure guidelines published by Popper et al. (2014) indicate that there is moderate risk of injury to larvae within tens of metres of a pile driving strike and low risk at distances greater than this. Should grayling larvae be dispersed within the offshore waters of the OWF Site, any localised injury or mortality is expected to be negligible in the context of the wider dispersion of larvae and natural mortality rates and underwater noise is not expected to result in a long-term decrease in the size of the population.</p> <p>EMF</p> <p>EMF is considered mainly in relation to the acute electro-reception and magneto-reception of sharks, noting that EMF from cables may interfere with shark movements and their ability to detect prey (Walker 2001). Walker (2001) predicted that the EMF emitted from the nearby Basslink 400 kV High Voltage Direct Current (HVDC) cable would, for much of the time, be of a magnitude within the range of high variation of naturally occurring electric fields normally experienced by marine animals. These electric fields will be detected by shark species, but the fields will not be strong enough to repel these species. Walker (2001) also considered whether the EMF from the Basslink HVDC cable could result in sharks avoiding crossing the cable and considered the effects on aggregations of white sharks; it was predicted that animals might react to the cable when in its vicinity near the seabed, but the animals are known to swim at various depths in the water column where they should be able to cross the cable. Sherwood et al. (2016) surveyed the operating Basslink HVDC cable and found that the magnetic field strengths were within 0.8% of those predicted from theory with strength dropping rapidly with distance from the cable; the magnetic field was less than 1% of natural background levels within 5 m of the cable. Noting that the Basslink HVDC cable is a 400 kV HVDC cable, the magnitude and extent of effects from the 66 kV inter-array cables and 220 kV export cables proposed for OWF Site are likely to be less.</p> <p>Hutchison et al. (2018) also studied the effects of an HVDC cable on elasmobranchs and concluded that behavioural responses do occur, however, that there was no evidence of the cable acting as a barrier to their movement. Inter-array cables and export cables are likely to be AC for this project, and EMF fields associated with AC frequencies are usually undetectable to most marine fauna beyond a few metres from the cable, with most species more sensitive to DC than AC EMFs (Normandeau et al. 2011). Therefore, EMF effects are not expected to result in impacts so significant that they result in a long-term decrease in the size of the population. EMF effects are less likely to occur in teleost (bony) fish species such as Australian grayling.</p> <p>Seabed disturbance</p> <p>Seabed disturbance and creation of artificial habitat associated with the installation and presence of subsea infrastructure could result in localised and short term disturbances to fishes, but may result in the attraction of other fish species and prey species in the longer term.</p> <p>Elevated turbidity and subsequent siltation of gravel spawning beds in rivers are noted in the National Recovery Plan for the Australian Grayling (Backhouse et al. 2008) as threats to adult spawning grayling. Transient</p>	

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>increases in suspended sediment in marine waters as a result of construction are not expected to significantly impact the species.</p> <p>Therefore, some adverse impacts on these fish species and their habitats are possible but they are unlikely to be of a magnitude or extent that results in a long-term decrease in the size of their respective populations. It is noted that there is some uncertainty regarding the extent of habitat utilisation within the OWF Site, which requires further investigation. Fish baseline surveys, underwater noise impact studies, and EMF impact studies are planned and will inform the detailed EIA.</p>	
Reduce the area of occupancy of an important population.	<p>Temporary and localised disturbances during construction (underwater noise, seabed disturbance) may result in localised avoidance by white sharks in the various Distribution BIAs overlapping the OWF Site and cable envelopes. Additionally, the OWF Site and cable envelopes overlap approximately a fifth of the Breeding (nursery) BIA along the east coast, and sharks may avoid using this segment of BIA (during construction). This includes direct disturbance and avoidance. However, construction disturbances will be temporary. Also, given the species is highly mobile, disturbances are unlikely to result in any extensive or long-term reduction in the area of occupancy. Operational effects are not expected to materially impact white shark distribution or occupancy, noting that they move between a wide range of habitats on the continental shelf. However, the potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region will be considered as part of the EIA process.</p> <p>Adult grayling do not occupy offshore marine waters, remaining in freshwater streams and coastal lagoons. The Project is not expected to materially reduce the broad area where grayling larvae may disperse offshore.</p> <p>The physical presence of foundations, artificial habitat creation, and EMF effects are also unlikely to reduce the occupancy of white sharks or grayling larvae/juveniles in the region. Cable EMF is unlikely to act as a barrier to movements of white sharks or graylings.</p> <p>Therefore, it is unlikely that the OWF Site will reduce the area of occupancy of the population of these species.</p>	Unlikely
Fragment an existing population into two or more populations.	<p>It is unlikely that the Project will result in the fragmentation of a population. Impacts from the OWF Site are not expected to present a barrier or limit the movement of white sharks, or the dispersion of Australian grayling larvae within the region.</p>	Unlikely
Adversely affect habitat critical to the survival of a species.	<p>No habitat critical to the survival of white sharks is currently defined. The Recovery Plan for the White Shark (Commonwealth of Australia 2013b) notes that identified foraging areas, aggregation areas (e.g., breeding/nursery area BIA off Corner Inlet and the East Gippsland Coast), and sites to which white sharks return on a regular basis may represent habitat critical to the survival of the species, however, further research is needed to identify such habitat. Although unlikely, a precautionary approach is adopted, whereby disturbance from underwater noise effects could adversely impact the nursery BIA along the Gippsland coast. The potential</p>	Potential for significant impact - however with the introduction of industry best practice management and

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region is also acknowledged and will be considered as part of the EIA process.</p> <p>The National Recovery Plan for the Australian Grayling (Backhouse et al. 2008) notes that given the wide distribution and range of habitats used by the species throughout its life, it is not practical to specify habitat that is critical to survival.</p>	mitigation measures, impacts are likely to be reduced to acceptable levels.
Disrupt the breeding cycle of an important population.	<p>The OWF Site and cable envelopes overlap the white shark nursery BIA located off the coast of East Gippsland. Underwater noise, particularly from foundation installation, has the potential to induce behavioural effects. While these effects are expected to be localised, some disruption to the distribution of juvenile sharks and the nursery BIA during construction is considered possible. The potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region is also acknowledged and will be considered as part of the EIA process.</p> <p>Mortality of Australian grayling larvae may occur during construction (locally) due to foundation installation and other activities. However, the Project location is not known to be of any specific significance for the species and in the context of the broad area over which larvae may be dispersed and the naturally high mortality rates and variability that all zooplankton are subject to, no discernible impacts are expected.</p>	Potential for significant impact - however with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels and not significant
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>Noting the potential for disturbance to occur within the white shark nursery BIA, underwater noise from construction activities, the presence of artificial habitat, and EMF from cables could temporarily modify or decrease the quality of white shark habitat within the nursery BIA. The potential for cumulative effects from the Project as well as other proposed offshore wind farms in the Gippsland region is also acknowledged and will be considered as part of the EIA process.</p> <p>It is noted that there is some uncertainty regarding the extent of habitat utilisation within the offshore Project Area, which requires further investigation. Fish baseline surveys and underwater noise impact studies are planned and will inform the detailed EIA.</p> <p>The Project location is not known to be of any specific significance for Australian grayling and in the context of the broad area over which larvae may be dispersed in coastal waters and the naturally high mortality rates and variability that all zooplankton are subject to, no discernible impacts are expected.</p>	Potential for significant impact - however with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels
Result in invasive species that are harmful to a Vulnerable species	For an IMS to be harmful, it would need to survive transport to the region (e.g., in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
becoming established in the Vulnerable species' habitat.		
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1 , it is unlikely that pathogens, viruses or other causes of disease will be introduced by Project vessels or equipment.	Unlikely
Interfere substantially with the recovery of the species.	<p>The Recovery Plan for the White Shark (Commonwealth of Australia 2013b) identifies fishing bycatch and shark control measures as the main threats to the white shark population. Ecosystem affects such as habitat modification and climate change (including changes in sea temperature, ocean currents and acidification) are also recognised, however, habitat modification due to the Project will not result in such large-scale environmental changes. While the above assessment recognises that some disturbance to white sharks in their nursery habitat is possible and this requires further investigation, the impacts are not expected to materially affect survivorship or recovery of the species.</p> <p>The National Recovery Plan for the Australian Grayling (Backhouse et al. 2008) identify barriers to migration in rivers, river flows and water quality, siltation in rivers, climate change, introduced species, disease and fishing as key threats to Australian grayling. Project activities and infrastructure in the marine environment are not expected to impact freshwater rivers and no significant impacts are expected to larval biomass offshore that would materially affect recovery of the species.</p>	Unlikely

5.3.4 LISTED MIGRATORY SPECIES

The EPBC Act desktop review identified the potential occurrence of 39 Migratory species as potentially occurring within the OWF Site. The EPBC Act desktop review identified the potential occurrence of 55 Migratory species as potentially occurring within the cable envelopes. Many of the species listed as Migratory are also listed as Threatened and impacts on these species have already been assessed against significant impact criteria in **Section 5.3.5**.

The assessment in Table 5-19 considers the potential for significant impacts on Migratory species collectively rather than on a species-by-species basis. Further investigation and assessment will be undertaken as part of the detailed EIA.

5.3.5 COMMONWEALTH MARINE AREA

The protection of the Commonwealth Marine Area includes the protection of its habitats, the functioning or integrity of its marine ecosystems, and populations of marine species. The assessment in Table 5-19 considers potentially significant impacts to the Commonwealth Marine Area, including to key species listed as Marine under the EPBC Act that may not have previously been assessed as a listed Threatened or Migratory species.

TABLE 5-19- PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: MIGRATORY SPECIES

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on a Migratory species if there is a real chance or possibility that it will:		
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a Migratory species.	<p>Birds</p> <p>The OWF Site and cable envelopes support numerous species of Migratory seabirds (species of albatross, petrel, tern and shearwater), Migratory shorebirds and Migratory land birds (refer to Section 4.6.7.1). Many of these Migratory species (including albatrosses, petrels, shearwaters) are also listed as Vulnerable, Endangered or Critically Endangered and potential effects have been assessed above in Section 5.3.5.1 and Section 5.3.5.2. The OWF Site will occupy an area that is used by many of these species, either for foraging or migration habitat and impacts are possible. The presence of operating turbines presents a potential barrier effect and risk of collision to these species. At this stage, it cannot be determined which species may be impacted or what the magnitude of impacts might be. Baseline bird surveys are currently underway to better characterise the species that utilise the OWF Site at different times of year. This information and collision risk modelling will be used to inform a detailed assessment of the potential impacts on populations.</p> <p>The particular species that may have their habitats impacted requires further assessment, but the following listed Migratory seabird species are noted due to the presence of breeding colonies or other significant habitat:</p> <ul style="list-style-type: none"> • Short-tailed Shearwater – Rookeries identified at Seal Island, Notch Island, Rag Island and Clifly Island (approximately 12 km and 14 km west of the OWF Site), and foraging BIA present in waters over the Bass Strait, including in the OWF Site. • Crested Tern – Rookeries identified at Seal Island, Notch Island, Rag Island and Clifly Island (approximately 12 km and 14 km west of the OWF Site). <p>Foraging BIAs are also present for listed Migratory Wandering Albatross, Black-browed Albatross, Buller's Albatross, Campbell Albatross, Indian Yellow-nosed Albatross and Shy Albatross. However, the BIAs are extensive, covering the whole of the South-east Marine Region, and the offshore Project Area represents a very small proportion of the available foraging habitats for these species. Therefore, the foraging habitats of these particular species are not expected to be significantly modified.</p> <p>Corner Inlet Ramsar site, located adjacent to the offshore Project Area, supports greater than 1% of the listed Migratory populations of Eastern Curlew, Grey Plover, Bar-tailed Godwit, Red Knot and Great Knot. Of these species, Eastern Curlew has most potential to occur in the OWF Site, as they are regular migrants beyond Victoria to Tasmania and islands in the Bass Strait.</p>	Potential for significant impact (seabirds and shorebirds only) - however with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels

Significant Impact Criteria	Assessment	Assessment Outcome
	<p>Given uncertainty about the presence, numbers and behaviours of listed Migratory seabirds and shorebirds within the OWF Site, the Project is conservatively assessed as having the potential for significant impact.</p> <p>Land birds listed under the EPBC Act as Migratory and with potential to overfly coastal waters include Satin Flycatcher, White-throated Needletail, Yellow Wagtail and Rufous Fantail, but they are not predicted to fly through the OWF Site in significant numbers and are unlikely to be significantly impacted.</p> <p>Cetaceans</p> <p>The OWF Site and cable envelopes support eight species of Migratory cetacean, including the Endangered Pygmy Blue Whale and Southern Right Whale. The Pygmy Blue Whale foraging BIA, Southern Right Whale migration BIA and reproduction BIA overlap with the OWF Site and/or cable envelopes. As assessed in Section 5.3.5.3, It is unlikely that BIAs or habitat for these species will be substantially modified, destroyed or isolated.</p> <p>Marine turtles</p> <p>The OWF Site and cable envelopes support three species of Migratory turtle. As assessed in Section 5.3.5.5 and Section 5.3.5.6, Green Turtle and Loggerhead Turtles are uncommon in the Bass Strait and the region does not support important habitat for these species. The Bass Strait is a significant feeding ground for Leatherback Turtles. However, the Project is not expected to significantly modify the habitat of this species.</p> <p>Fish</p> <p>The OWF Site and cable envelopes support four species of Migratory fish: White Shark, Porbeagle, Whale Shark and Short Fin Mako Shark. These species are highly mobile, and their habitats are widespread. As assessed for White Shark in Section 5.3.5.8, there is the potential for disturbance to the white shark nursery BIA during construction of the wind farm but the Project is not expected to significantly modify or destroy the habitat of this species.</p>	
<p>Result in an invasive species that is harmful to the Migratory species becoming established in an area of important habitat for the Migratory species.</p>	<p>For an IMS to be harmful to a Migratory species, it would need to survive transport to the region (e.g., in vessel ballast water or as biofouling), establish itself within the Project Area, and then result in a decline in native prey species or pose a toxicity threat to animals that may forage on them. With the control measures and compliance with legislation outlined in Section 5.1, it is unlikely that IMS will become established.</p>	<p>Unlikely</p>

Significant Impact Criteria	Assessment	Assessment Outcome
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a Migratory species.	<p>As identified in the assessments above, there is the potential for disruption to the following groups of listed Migratory species:</p> <ul style="list-style-type: none"> Seabirds (e.g., Short-tailed Shearwater, Crested Tern) and shorebirds (e.g. Eastern Curlew), as a result of operating turbines causing collision, displacement, and/or a barrier to migration Cetaceans, specifically Pygmy Blue Whales and Southern Right Whales (as a result of underwater noise disturbance disrupting breeding, foraging, migration or resting behaviours) Fish, specifically White Shark (as a result of underwater noise within a breeding and nursery BIA). <p>Further investigation and assessment are proposed as part of the detailed EIA to determine if the Project is likely to disrupt an ecologically significant proportion of a population of one of these Migratory species. With the introduction of best practice management and mitigation measures, impacts are likely to be reduced.</p>	Potential for significant impact - however with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels

TABLE 5-20 PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS TO MNES: COMMONWEALTH MARINE AREA

Significant Impact Criteria	Assessment	Assessment Outcome
An action is likely to have a significant impact on the environment in a Commonwealth marine area if there is a real chance or possibility that the action will:		
Result in a known or potential pest species becoming established in the Commonwealth marine area	With the control measures and compliance with legislation outlined in Section 5.1 , it is unlikely that IMS will become established.	Unlikely
Modify, destroy, fragment, isolate or disturb an important or substantial area of habitat such that an adverse impact on marine ecosystem	Habitat modification and disturbance will be limited to direct disturbance from the footprint of foundations and other infrastructure on the seabed, as well as suspended sediments, sediment deposition and/or scour around installed foundations. The OWF Site is located on a relatively featureless area of seabed dominated by soft-sediments devoid of significant bathymetric features. Similarly, the coastal habitats present in the nearshore waters of the Nearshore Cable Envelope are comprised of soft sediment, that support patches of seagrass, algae, and invertebrates. Benthic habitat surveys will be undertaken and the locations of foundations, cables and other infrastructure will avoid or minimise disturbance to sensitive habitats and communities.	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
functioning or integrity in a Commonwealth marine area results.	No KEFs are present within or near the Project. No TECs are known to occur in the OWF Site or cable envelopes and Project activities are unlikely to directly or indirectly impact Subtropical and temperate coastal Saltmarsh TEC in wetland areas adjacent to the Nearshore Cable Envelope (see Section 5.3.4). Therefore, habitat is not expected to be modified, destroyed, fragmented, isolated or disturbed such that an adverse impact on marine ecosystem functioning or integrity occurs.	
Have a substantial adverse effect on a population of a marine species or cetacean including its life cycle (for example, breeding, feeding, migration behaviour, life expectancy) and spatial distribution.	As identified in the assessments above, there is the potential for impacts to the following groups and species, which are listed as Marine: <ul style="list-style-type: none"> Seabirds (e.g., Short-tailed Shearwater, Crested Tern), shorebirds (e.g., Eastern Curlew) and migratory land birds (e.g., Swift Parrot) as a result of operating turbines presenting a collision risk and barrier to migration) Cetaceans, including Pygmy Blue Whales and Southern Right Whales (due to underwater noise disturbance disrupting foraging, migration or resting behaviours) Fish, specifically White Shark (due to underwater noise within a breeding and nursery BIA). Other species listed as Marine, but not listed as Threatened or Migratory include the Australian Fur Seal, Long-nosed Fur Seal and Little Penguin. Populations of these species may be impacted during construction (e.g., underwater noise and vibration) and during operation (e.g., foraging habitat modification). With the introduction of best practice management and mitigation measures, impacts are likely to be reduced.	Potential for significant impact - however with the introduction of industry best practice management and mitigation measures, impacts are likely to be reduced to acceptable levels
Result in a substantial change in air quality or water quality (including temperature) which may adversely impact on biodiversity, ecological integrity, social amenity or human health.	The OWF will not directly produce air emissions. Air emissions are associated with fabrication and construction, including engine emissions from vessels. However, vessel emissions will be managed in accordance with Australian and international maritime legislation (e.g., Marine Orders, International Convention for the Prevention of Pollution from Ships [MARPOL]). Emissions are not expected to adversely impact on biodiversity, ecological integrity, social amenity or human health. Changes in water quality may occur due to vessel discharges and suspension of seabed sediments. Planned and unplanned vessel discharges will be managed in accordance with Australian and international maritime legislation (e.g., Marine Orders, International Convention for the Prevention of Pollution from Ships [MARPOL]). Changes in water quality will be localised and are not expected to adversely impact on biodiversity, ecological integrity, social amenity or human health. A fuel or chemical spill could potentially have extensive impacts on water quality, but this is highly unlikely to occur.	Unlikely
Result in persistent organic chemicals, heavy metals, or other potentially harmful chemicals	A fuel or chemical spill could potentially result in persistent organic chemicals, heavy metals, or other potentially harmful chemicals accumulating in the marine environment. However, this is highly unlikely to occur.	Unlikely

Significant Impact Criteria	Assessment	Assessment Outcome
accumulating in the marine environment such that biodiversity, ecological integrity, social amenity or human health may be adversely affected.		
Have a substantial adverse impact on heritage values of the Commonwealth marine area, including damage or destruction of an historic shipwreck.	There are no shipwrecks in the OWF Site or cable envelopes. Micrositing of the export cable(s) to avoid the wreck site and potential downstream effects (e.g. erosion, burial) will be possible. Impacts on heritage values are not expected to occur (refer to GEOW Preliminary Heritage Constraints Assessment Report [ERM, 2024b]).	Unlikely

5.4 EES REFERRAL CRITERIA

A self-assessment was undertaken of the project's potential impacts on environmental values within Victoria against the referral criteria provided in the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (8th edition, DTP 2023). The self-assessment considers the following to the extent relevant to this preliminary marine assessment:

- **Individual referral criteria (Table 5-21)** – Individual types of potential effects on the environment that might be of regional or state significance, and therefore warrant referral of a project.
- **Combined referral criteria (Table 5-22)** – A combination of two or more potential effects on the environment that might be of regional or state significance, and therefore warrant referral of a project.

The assessment also considers the potential for indirect effects resulting from activities within Commonwealth waters.

The potential for referral criteria to be met are assessed as 'Yes', 'Potentially', 'Unlikely' or 'No'.

TABLE 5-21 EES REFERRAL CRITERIA – INDIVIDUAL POTENTIAL ENVIRONMENTAL EFFECTS

Referral Criteria	Referral Criteria Met?	Comments
<p>Potential removal, destruction or lopping of 10 ha or more of native vegetation that consists of, or comprises a combination of:</p> <ul style="list-style-type: none"> an EVC classified as Endangered; or an EVC that is classified as vulnerable (with a condition score of 0.5 or more) or rare (with a condition score of 0.6 or more) and that is not authorised for removal under an approved Forest Management Plan or Fire Protection Plan 	Direct effects	
	No	<p>Noting that this criterion relates to potential onshore effects on terrestrial native vegetation in accordance with the <i>Guidelines for the removal, destruction or lopping of native vegetation</i>, which are not relevant to this Preliminary Marine Assessment Report, this assessment has considered the project's potential effects on seagrass and algae communities in Victorian coastal waters.</p> <p>Most of the Nearshore Cable Envelope is classified in Seamap Australia as having no visible biota, although several tracts of seagrass and algae extend from approximately Woodside Beach towards Corner Inlet and Wilson's Promontory (Figure 4-4). Dive surveys conducted for the Basslink project at two locations west of the Nearshore Cable Envelope, at distances of 1 km and 5 km offshore, showed medium grain sand at both locations. No sedentary epibiota were visible at the inshore site during two survey events, while the offshore site showed the presence of swimming anemones, soft coral and seastars in very low numbers (Sherwood et al. 2016).</p> <p>Victorian Biotope Atlas records confirm the presence of a range of habitats and habitat complexes, including 'Sublittoral mixed sediments', 'Sublittoral sand and muddy sand', 'Infralittoral fine sand', 'High energy infralittoral rock', 'Non-reef sediment epibenthos', 'Rippled fine sand' and 'Littoral sand', as described in Table 4-1. Nearshore waters in the north-western part of the Nearshore Cable Envelope also include the biotopes, 'Grey mounded colonies with seabed erect sponges (Ninety Mile Beach E)' and 'Thallose Red Algae with Abundant Feather Stars (Ninety Mile Beach A)' (Table 4-1).</p> <p>Should any seagrass and algae communities be present in shallow coastal waters of the Nearshore Cable Envelope, it is noted that these communities may provide habitat of conservation significance. Further site investigations will be undertaken to characterise the benthic habitats of the Nearshore Cable Envelope to inform avoidance and minimisation measures for the final cable route. With these measures in place, it is considered highly unlikely that 10 ha or more of these communities would be affected.</p>
	Indirect effects from activities in Commonwealth waters	
	No	Indirect effects that result in native vegetation effects are not expected to occur.
	Direct effects	

Referral Criteria	Referral Criteria Met?	Comments
Potential clearing of an area determined as 'critical habitat' under the <i>Flora and Fauna Guarantee Act 1988</i>		No critical habitats determined under the FFG Act have been identified in the Nearshore Cable Envelope. No direct effects are expected.
		Indirect effects from activities in Commonwealth waters
		No critical habitats determined under the FFG Act have been identified in the Nearshore Cable Envelope. No indirect effects are expected.
Potential for loss of a significant proportion (e.g. 1 percent or greater) of known remaining habitat or population of a Threatened species within Victoria.	Direct effects	
	Unlikely	<p>Habitats and/or BIAs relevant to species listed as Threatened under the FFG Act that are overlapped by the proposed Nearshore Cable Envelope include:</p> <ul style="list-style-type: none"> Seabirds: Foraging BIAs for White-faced Storm Petrel (East Gippsland), Wandering Albatross, Buller's Albatross, Campbell Albatross, Indian Yellow-nosed Albatross, Shy Albatross (whole south-east marine region). Cetaceans: Known foraging and distribution BIA for Pygmy Blue Whales, migration BIA and reproduction BIA for Southern Right Whales, migration habitat (not BIA) for Humpback Whales. Turtles: Bass Strait is a significant feeding ground for Leatherback Turtles. Fish: White Shark breeding (nursery) BIA (Gippsland coast). <p>Direct loss of any known habitat within state waters (Nearshore Cable Envelope) is not expected. Direct disturbance to habitat will be limited to the installation of the export cable, but this would not result in the long-term loss of habitats for reproduction, foraging or migration.</p> <p>Cable installation activities and operations within the state jurisdiction are not expected to directly affect any species at a population level. Effects from cable installation will be localised and temporary and would not have long term effects on known remaining habitat for the survival of Threatened species. The Nearshore Cable Envelope overlaps only 0.13% of the Southern Right Whale Reproduction BIA in state waters. Furthermore, no activities will be undertaken that are inconsistent with a Recovery Plan (EPBC Act) or Action Statement (FFG Act) for threatened whale species. A range of control options will be implemented to prevent disturbance to Southern Right Whale habitat during the breeding and calving season (May-September). These may include increased monitoring and use of marine mammal observers, observation zones and DP shut-down procedures, and limits on vessel speeds. A risk-based adaptive management plan will be developed and informed by underwater noise modelling of vessel thrusters to determine effects distances, along with in-field monitoring for whales during cable installation activities.</p>

Referral Criteria	Referral Criteria Met?	Comments
		<p>Risks</p> <p>It is possible that an unplanned fuel or chemical spill from a vessel, or unplanned introduction of IMS, or unplanned vessel strike with marine fauna in state waters could impact FFG Act-listed Threatened species. However, such risks are unlikely to occur with the implementation of legislated and standard control measures.</p>
		<p>Indirect effects from activities in Commonwealth waters</p>
	Unlikely	<p>No indirect effects to habitat</p> <p>Indirect effects on FFG Act-listed Threatened species in state jurisdiction associated with Project components in adjacent Commonwealth waters are unlikely as follows:</p> <ul style="list-style-type: none"> Underwater noise impacts – noise produced by foundation installation, other construction / decommissioning activities and vessel thrusters has the potential for impacts to marine fauna ranging from behavioural effects through to auditory impairment or injury where animals are exposed at close range or for extended periods of time. Implementation of control measures (including observation zones, soft-start procedures and shutdown procedures for high-intensity noise sources) reduce the risk of auditory impairment or injury. Behavioural effects and temporary hearing impairment (temporary threshold shift) are still possible. However, these effects are unlikely to lead to a long-term loss of habitat or decrease in the size of populations. Injury/impairment of listed Threatened marine mammal species in state jurisdiction from activities in the OWF Site (including foundation installation and DP operations), is considered unlikely given the location, which is more than 18 km from the closest state waters, and the implementation of management measures and noise attenuation systems (such as bubble curtains for piling). Some behavioural disturbance to animals in state waters as a result of noise-intensive activities, such as piling, at the OWF Site, may occur. However, such activities will be temporary in nature and with noise attenuation systems in place and noise modelling to determine effects distances and inform controls, this is unlikely to lead to the long-term loss of a significant proportion of a population or habitat of a species. Behavioural disturbance to foraging or migration activities may occur to some animals during cable installation near the state waters boundary, although the area of disturbance or displacement is likely to be small relative to wider habitat and distribution and the broader population. Migrating animals may temporarily avoid the area, but this would not impede their migration to or from important coastal habitat in state waters. Effects from cable installation activities in the Offshore Cable Envelope will be localised and temporary and would not have long term effects on known or remaining habitat for a species that is listed as threatened within Victoria. Long term impacts on populations are unlikely. Underwater noise modelling of project activities will be undertaken to determine effects distances and

Referral Criteria	Referral Criteria Met?	Comments
		<p>risk-based adaptive management and timing controls will be considered for relevant Threatened species (e.g., Southern Right Whales, Blue Whales). This could include in-situ noise level verification monitoring, increased monitoring and use of marine mammal observers, observation zones and shut-down procedures, and limits on vessel speeds. No activities will be undertaken that are inconsistent with a Recovery Plan (EPBC Act) or Action Statement (FFG Act) for threatened whale species.</p> <p>Baseline marine mammal surveys are currently underway to inform project development. Potential impacts on populations (including threatened whale species listed under the FFG Act in Victoria) will be mitigated through the measures identified and adopted as part of the EPBC assessment process.</p> <ul style="list-style-type: none"> • Collision risk / potential disturbance/displacement and barrier effects – Turbines present a collision risk for birds in the OWF Site and may also cause potential disturbance/displacement, including potential barrier effects to migratory species. Given the OWF Site is more than 18 km from the closest state waters, habitats in state jurisdiction will not be affected. Impacts on populations (including seabirds, shorebirds and migratory land birds listed under the FFG Act in Victoria) from activities in Commonwealth waters will be assessed and mitigated through the EPBC referral and assessment process. Baseline surveys to determine species presence and flight heights at different times of the year within the OWF Site are currently being carried out to inform the impact assessment process and development of mitigation measures to minimise potential barrier effects and collision risk, including design considerations (e.g. turbine specifications). The potential impacts of turbine operations will be assessed and mitigated through the EPBC assessment process. <p>Risks</p> <ul style="list-style-type: none"> • Unplanned introduction of IMS – It is possible that the unplanned introduction of IMS (within state waters or adjacent Commonwealth Waters) could have far reaching implications on marine ecological communities and indirectly effect FFG Act-listed Threatened species. However, such an event is unlikely to occur given the implementation of legislation and standard control measures. • Unplanned fuel/ chemical spill – It is possible that an unplanned fuel spill from a vessel could impact Threatened species. However, such an event is unlikely to be significant or likely to occur given the implementation of legislated and standard control measures. <p>Detailed site investigations are underway to understand the presence, abundance, timing, and utilisation of the OWF Site and cable envelopes by birds and marine fauna to confirm these conclusions.</p>
Potential for long-term change to the ecological character of a wetland Listed under the Ramsar Convention or in 'A	Direct effects	
	No	No Ramsar wetlands or nationally important wetland sites are affected by the Project Area. With the implementation of measures such as HDD beneath coastal values to reduce impacts, these wetlands are not expected to be directly impacted by Project activities in state waters (see Section 5.3.3)

Referral Criteria	Referral Criteria Met?	Comments
Directory of Important Wetlands in Australia'	Indirect effects from activities in Commonwealth waters	
	Unlikely	No Ramsar wetlands or nationally important wetland sites are expected to be indirectly impacted by Project activities in Commonwealth waters (see Section 5.3.3).
Potential for extensive or major effects on the use and environmental values of water resources due to changes in water quality, water availability, stream flows, water system function, or regional groundwater levels, or the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long-term.	Direct effects	
	Unlikely	<p>The Nearshore Cable Envelope is located within the <i>Open Coast</i> marine segment (subsegment <i>Gippsland (Two-Fold)</i>) of Victoria's surface waters for the purpose of Victoria's Environment Reference Standard (ERS). The relevant environmental values for this segment are outlined in Table 5.6 of the ERS and include water dependent ecosystems (largely unmodified), navigation and shipping, aquatic foods for human consumption, Traditional Owner cultural values and water-based recreation.</p> <p>The Nearshore Cable Envelope does not overlap with inland aquatic or estuarine ecosystems. However, several of the Project aspects and effects identified in Section 5.1 have the potential to impact marine ecosystems in state waters. These include seabed disturbance during cable installation, the physical presence of operating cables, EMF, introduction of IMS, and unplanned fuel/chemical spills.</p> <p>Seabed disturbance during installation of export cables in state waters would be localised and temporary in nature and scale. Seabed habitats in state waters are predominantly soft sediments dominated by benthic infauna. Areas of algae and seagrass are understood to be present. It is likely that significant areas of seagrass can be avoided by the selected export cable routes and micro-siting of infrastructure. Regardless, any disturbance would be localised and is not expected to have extensive or major effects.</p> <p>The physical presence of cable protection in state waters would create hard substrate and artificial habitat that would support the establishment of encrusting biota and associated assemblages (e.g. invertebrates, fish). The extent of these changes would be limited to the footprint of infrastructure and therefore is unlikely to be extensive in the context of the broader marine ecosystem. A more detailed ecology assessment will be undertaken to confirm this.</p> <p>EMF from cables may affect the behaviours of some species (e.g., sharks) although they are not expected to act as a barrier to species' movement or result in long-term impacts. Further assessment of the effects of EMF will be conducted as part of the EIA to confirm this.</p> <p>Risks</p> <p>With the implementation of control measures and compliance with legislation outlined in Section 5.1, it is unlikely that IMS will become established.</p>

Referral Criteria	Referral Criteria Met?	Comments
Potential for extensive or major effects to human health or the environment, or displacement of residents, from pollution or waste emitted to air, land, water or groundwater.		If an unplanned event, such as a fuel/chemical spill, were to occur (e.g., vessel collision resulting in ruptured fuel tank), the released hydrocarbons or chemicals could have significant effects to marine and estuarine ecosystems. However, with the preventative and mitigative controls outlined in Section 5.1 , it is highly unlikely that such an incident and subsequent impacts will occur.
	Indirect effects from activities in Commonwealth waters	
	Unlikely	Localised changes to turbidity values during construction and in hydrodynamic processes (scour/deposition) around structures in Commonwealth waters, once installed, are not expected to have any regional or long term effects on marine and coastal habitats in state waters. Coastal processes modelling is proposed to assess the extent of physical changes to confirm this.
	Direct effects	
	No	<p>The OWF will not directly produce air emissions. Air emissions are associated with fabrication and construction, including engine emissions from vessels. However, vessel emissions will be managed in accordance with Australian and international maritime legislation (e.g., Marine Orders, International Convention for the Prevention of Pollution from Ships [MARPOL]). Emissions are not expected to adversely impact on the health, safety or well-being of a human community.</p> <p>Changes in water quality may occur due to vessel discharges and suspension of seabed sediments. Vessel discharges will be managed in accordance with Australian and international maritime legislation (e.g., Marine Orders, International Convention for the Prevention of Pollution from Ships [MARPOL]). Changes in water quality will be localised and are not expected to adversely impact on the health, safety or well-being of a human community.</p> <p>A fuel or chemical spill could potentially have extensive impacts on water quality, but this is highly unlikely to occur.</p> <p>The Project is not expected to displace any residences.</p>
	Indirect effects from activities in Commonwealth waters	
	No	Air emissions from vessels in Commonwealth waters are not considered relevant to the assessment of community impacts given that they will be managed in accordance with Australian and international maritime legislation, and air emissions will rapidly disperse. They will not affect coastal communities.

Referral Criteria	Referral Criteria Met?	Comments
		Risks In the unlikely event that a large fuel/chemical spill were to occur in Commonwealth waters (e.g., vessel collision resulting in ruptured fuel tank), it is possible the released hydrocarbons or chemicals could reach state waters and the coastline. However, with the preventative and mitigative controls outlined in Section 5.1 , it is highly unlikely that such a major incident and subsequent impacts will occur.

TABLE 5-22 EES REFERRAL CRITERIA – COMBINATION OF ENVIRONMENTAL EFFECTS

Referral Criteria	Referral Criteria Met?	Comments
Potential removal, destruction or lopping of 10 Ha or more of native vegetation, unless it is authorised for removal under an approved Forest Management Plan or Fire Protection Plan.	Direct effects	
	Unlikely	<p>As this Preliminary Marine Assessment Report is not relevant to onshore native vegetation impacts, this assessment has considered the project's potential effects on seagrass and algae communities in Victorian coastal waters.</p> <p>As noted above, most of the Nearshore Cable Envelope is classified in Seamap Australia as having no visible biota, although several tracts of seagrass and algae extend from approximately Woodside Beach towards Corner Inlet and Wilson's Promontory (Figure 4-4).</p> <p>Should any seagrass and algae communities be present in shallow coastal waters of the Nearshore Cable Envelope, it is noted that these communities may provide habitat of conservation significance. Further site investigations will be undertaken to characterise the benthic habitats of the Nearshore Cable Envelope to inform avoidance and minimisation measures for the final cable route. With these measures in place, it is considered highly unlikely that 10 ha or more of these communities would be affected.</p>
	Indirect effects from activities in Commonwealth waters	
	No	Indirect effects causing native vegetation clearance are not expected to occur.
Matters listed under the <i>Flora and Fauna Guarantee Act 1988</i> :	Direct effects	
	Unlikely	<u>Potential loss of a significant area of a Listed ecological community</u>

Referral Criteria	Referral Criteria Met?	Comments
<ul style="list-style-type: none"> Potential loss of a significant area of a Listed ecological community; or Potential loss of a genetically important population of an Endangered or Threatened species (Listed or nominated for listing), including from loss or fragmentation of habitats; or Potentially significant effects on habitat values of a wetland supporting migratory bird species. 		<p>No FFG listed TECs were identified in the Nearshore Cable Envelope based on the Scientific Advisory Committee's TEC distribution descriptions. Therefore, no direct disturbance from cable installation activities or downstream effects (i.e., increased turbidity from cable trenching) are expected to impact 'Listed' ecological communities.</p> <p><u>Potential loss of a genetically important population of an Endangered or Threatened species</u></p> <p>Birds</p> <p>FFG Act listed seabirds (including species of albatross, petrels, terns), shorebirds (including species of sand piper, curlews, plovers, terns, knots, godwits, ducks and egrets), and migratory land birds (including Orange-Bellied Parrot and Swift Parrot).</p> <p>The installation of export cables and shore crossing activities, which is likely to involve HDD beneath coastal values to reduce impacts, is not expected to have any significant effects on birds. Disturbance from shore crossing activities will be temporary and is not expected to result in the loss of a genetically important population. The greatest risk to environmental values is likely to be species or TECs associated with the coastal dunes and adjacent estuarine wetland vegetation. Careful development design and timing of construction activities (such as implementing restricted areas and/or controls during sensitive life-stages for priority shorebird habitats during shoreline construction activities) and construction/installation methods (e.g., the use of HDD) would reduce any impacts to acceptable levels.</p> <p>Other project aspects with the potential to impact bird populations include artificial light from cable installation vessels. Impacts will depend to some degree upon the selected cable routes and shore crossing locations. With the implementation of the measures listed above, and methods to reduce non-essential lighting, effects are not expected to result in the loss of a genetically important population or significant effects on habitat values of relevant wetlands. However, artificial light impacts and mitigation require further assessment as part of the EIA process.</p> <p>Marine mammals</p> <p>FFG Act-listed marine mammals include the Blue Whale, Humpback Whale, Southern Right Whale, and Long-Nosed Fur Seal.</p> <p>As described above, underwater noise from Project activities and infrastructure in the Nearshore Cable Envelope may result in localised and short-term disturbances but are not expected to result in the loss of a genetically important population. The Nearshore Cable Envelope overlaps only 0.13% of the Southern Right Whale Reproduction BIA in state waters. Furthermore, no activities will be undertaken that are inconsistent with a Recovery Plan (EPBC Act) or Action Statement (FFG Act) for threatened whale species. A range of control options will be implemented to prevent disturbance to</p>

Referral Criteria	Referral Criteria Met?	Comments
		<p>Southern Right Whale habitat during the breeding and calving season (May-September). These may include scheduling of activities, increased monitoring and use of marine mammal observers, observation zones and DP shut-down procedures, and limits on vessel speeds. A risk-based adaptive management plan will be developed and informed by underwater noise modelling of vessel thrusters to determine effects distances, along with in-field monitoring for whales during cable installation activities.</p> <p>Turtles</p> <p>The northern Bass Strait is a significant feeding ground for FFG Act-listed Leatherback Turtles. Underwater noise from cable installation activities may result in only localised and short-term behavioural responses, which is not expected to result in the loss of the east coast population that visits the Bass Strait.</p> <p>Fish</p> <p>The Endangered Australian Grayling spends most of its life in freshwater streams and brackish coastal lagoons. The stage that is spent in coastal waters is the newly hatched larval stage when they drift downstream and out into coastal waters, where they remain for approximately six months before juveniles migrate back into fresh water. Elevated turbidity and underwater noise from cable installation activities in state waters may result in highly localised areas of avoidance by juvenile fish, but their movements towards estuarine and freshwater river channels (which are located outside of the Nearshore Cable Envelope) are not expected to be impacted. Increased turbidity and subsequent siltation of gravel spawning beds in rivers are noted in the National Recovery Plan for the Australian Grayling as threats to adult spawning grayling. However, no river mouths situated in or near the Nearshore Cable Envelope and therefore so no sedimentation impacts are expected to occur.</p> <p>The Nearshore Cable Envelope overlaps with BIA's for the Endangered White Shark. Elevated turbidity and underwater noise from cable installation activities in state waters may result in localised avoidance, but no significant impacts are expected to occur.</p> <p><u>Potential significant effects on habitat values of a wetland supporting migratory bird species</u></p> <p>No Ramsar wetlands or nationally important wetland sites occur within the Nearshore Cable Envelope. Corner Inlet Ramsar site is located 20 km from the Nearshore Cable Envelope.</p>
		Indirect effects from activities in Commonwealth waters
	Unlikely	<u>Potential loss of a significant area of a Listed ecological community</u>

Referral Criteria	Referral Criteria Met?	Comments
		<p>No FFG listed TECs were identified in the OWF Site or cable envelopes based on the Scientific Advisory Committee's TEC distribution descriptions. Therefore, no indirect effects from Project components in Commonwealth waters are expected to 'Listed' ecological communities.</p> <p><u>Potential loss of a genetically important population of an Endangered or Threatened species</u></p> <p>Birds</p> <p>The key aspect associated with Project components in Commonwealth waters that may have an indirect effect on FFG Act-listed Threatened bird populations is 'Operating turbines – collision risk / potential disturbance/displacement and barrier effects'. Offshore wind project experience from the UK and Europe demonstrates that it is unlikely that collision mortalities will lead to a significant decrease in the size of a population. A recent monitoring study by Tjørnløv et al. (2023) using radar to monitor seabird movements within an offshore wind farm in the UK even reported that no collisions or even narrow escapes were recorded in over 10,000 bird videos during the two years of monitoring. However, collision risk and barrier effects need to be assessed based on local Australian species and populations. The level of impact associated with collision risks and potential disturbance/displacement or barrier effects is uncertain; this will depend upon the relative abundance of bird species within the OWF Site, their utilisation of the OWF Site for migration and/or foraging, their typical flight heights and avoidance behaviours, and the size of individual populations.</p> <p>Shorebird species have a preference for foraging on the shoreline, in coastal habitat or the intertidal zone, rather than offshore on deep waters; the potential for impacts on these populations will largely depend on whether species migrate through the OWF Site. Most shorebirds migrate from the northern hemisphere and south east Asia so their migration route is generally to/from the north rather than through the OWF Site, but local movements of these species over coastal and offshore waters may also occur for species that continue migration over the Bass Strait to Tasmania.</p> <p>Migratory land bird species include the Critically Endangered Orange-bellied Parrot and Swift Parrot. The OWF Site avoids the probable migration route for Orange-bellied Parrots. Migration of Swift Parrots from Tasmania to the Australian mainland could occur through the OWF Site, but the species disperses widely throughout the Eastern states of Australia.</p> <p>In all cases, the collision risk and potential disturbance/displacement or barrier effects posed by the Project is unlikely to cause impacts as to result in the loss of a population.</p> <p>Artificial lighting from vessel and construction activities, and from lighting on turbines in Commonwealth waters also has the potential for indirect effects to FFG Act-listed Threatened birds</p>

Referral Criteria	Referral Criteria Met?	Comments
		<p>in state jurisdiction. The magnitude and extent of these effects and mitigation requires further assessment but are not expected to result in the loss of a genetically important population.</p> <p>Impacts on populations (including seabirds, shorebirds and migratory land birds listed under the FFG Act in Victoria) from activities in Commonwealth waters will be assessed and mitigated through the EPBC referral process. Baseline surveys to determine species presence and flight heights within the OWF Site at different times of the year will be carried out to inform the impact assessment process and development of mitigation measures to minimise potential barrier effects and collision risk, including design considerations (e.g. turbine configuration). The potential impacts of turbine operations will be assessed and mitigated through the EPBC assessment process.</p> <p>Marine mammals</p> <p>FFG Act-listed marine mammals include Blue Whale, Southern Right Whale, Humpback Whale and Long-nosed Fur Seal.</p> <p>Blue Whale and Southern Right Whale are identified as key species for management, given the potential for disturbance to Pygmy Blue Whale foraging behaviours, and the migration and reproductive behaviours of Southern Right Whales in coastal waters. However, impacts are not expected to result in the loss of a genetically important population.</p> <p>As described above, underwater noise produced by foundation installation, other construction / decommissioning activities and vessel thrusters has the potential for impacts to marine fauna ranging from behavioural effects, through to auditory impairment or injury where animals are exposed at close range or for extended periods of time. Implementation of control measures (including noise attenuation systems, observation zones, soft-start procedures and shutdown procedures for high-intensity noise sources) reduce the risk of auditory impairment or injury. Behavioural effects and temporary hearing impairment (temporary threshold shift) are still possible. However, these effects are unlikely to lead to a long-term loss of habitat or decrease in the size of populations.</p> <p>Injury/impairment of listed Threatened marine mammal species in state jurisdiction is considered unlikely from activities in the OWF Site (including foundation installation and DP operations), given the location, which is more than 18 km from the closest state waters, and use of noise attenuation systems (such as bubble curtains for piling). Some behavioural disturbance to animals in state waters as a result of noise-intensive activities, such as piling, at the OWF Site, may occur. However, such activities will be temporary in nature and with noise attenuation systems in place and noise modelling to determine effects distances and inform controls, this is unlikely to lead to the long-term loss of a genetically important population of an Endangered or Threatened species or loss of critical habitat.</p>

Referral Criteria	Referral Criteria Met?	Comments
		<p>Behavioural disturbance to foraging or migration activities may occur to some animals during cable installation near the state waters boundary, although the area of disturbance or displacement is likely to be small relative to wider habitat and distribution and the broader population. Migrating animals may temporarily avoid the area but this would not impede their migration to or from important coastal habitat in state waters. Effects from cable installation activities in the Offshore Cable Envelope will be localised and temporary and would not have long term effects on habitat that is critically important for the survival of Threatened species. Long term impacts on populations are unlikely. Underwater noise modelling of project activities will be undertaken to determine effects distances and risk-based adaptive management and timing controls will be considered for relevant Threatened species (e.g., Southern Right Whales, Blue Whales). This could include scheduling of activities, in-situ noise level verification monitoring, increased monitoring and use of marine mammal observers, observation zones and shut-down procedures, and limits on vessel speeds. No activities will be undertaken that are inconsistent with a Recovery Plan (EPBC Act) or Action Statement (FFG Act) for threatened whale species. Impacts on populations (including threatened whale species listed under the FFG Act in Victoria) will be assessed and mitigated through the EPBC referral process.</p> <p>Turtles</p> <p>The northern Bass Strait is a significant feeding ground for Leatherback (Leathery) Turtles. Underwater noise from construction (e.g., foundation installation) in Commonwealth waters is unlikely to result in any significant indirect effects in state waters given the distance over which the sound will propagate (16 km) and the transmission losses that are likely to occur before sound reaches state waters. Soft start procedures for foundation installation will limit the risk of injury to turtles in Commonwealth waters and additional mitigation (e.g., turtle shut down procedures) will also be considered during the detailed impact assessment if necessary to prevent impacts. Short-term disturbances to individuals or groups of Leatherback Turtles in the vicinity of construction activities are not expected to result in the loss of the east coast population that visits the Bass Strait.</p> <p>Fish</p> <p>The Endangered Australian Grayling spends most of its life in freshwater streams and brackish coastal lagoons. The stage that is spent in coastal waters is the newly-hatched larval stage when they drift downstream and out into coastal waters, where they remain for approximately six months before juveniles migrate back into fresh water. Underwater noise and vibration during foundation installation in the OWF Site is expected to have limited impact on Grayling larvae. Larvae will disperse widely in coastal waters. Should Grayling larvae be dispersed within the offshore waters of the OWF Site, any localised injury or mortality is expected to be negligible in the context of the</p>

Referral Criteria	Referral Criteria Met?	Comments
		<p>wider dispersion of larvae and natural mortality rates and underwater noise is not expected to result in a long-term decrease in the size of the population.</p> <p>White Sharks are also an identified FFG Act-listed Endangered species. Underwater noise from construction (e.g., foundation installation) in Commonwealth waters is unlikely to result in any significant indirect effects in state waters given the distance over which the sound will propagate (16 km) and the transmission losses that are likely to occur before sound reaches state waters. Sharks belong to a group of fishes that lack a swim bladder and are, therefore, insensitive to changes in sound pressure in the water column. Sharks are, however, able to detect vibrations and acoustic particle motion component of sound at relatively close range (Popper et al. 2014). Sound exposure guidelines published by Popper et al. (2014) indicate that injury and impairment effects would be limited to close range while significant behavioural effects are likely to be limited to tens or hundreds of metres from the foundation installation activities. Given white sharks naturally forage over large areas, with numerous foraging grounds within the Bass Strait, underwater noise is not expected to result in a long-term decrease in the size of the population.</p> <p><u>Potential significant effects on habitat values of a wetland supporting migratory bird species</u></p> <p>The Corner Inlet and Gippsland Lakes Ramsar sites are located 25 km and 37 km from the OWF Site respectively, and 5.6 km from Commonwealth waters where export cable installation activities may take place in the Offshore Cable Envelope. Other coastal wetlands include temperate saltmarsh habitats at Jack Smith Lake and other locations, but these are located behind the dune system of Ninety Mile Beach. Indirect, downstream effects from Commonwealth waters are not expected to occur.</p>
Potential for extensive or major effects to the environment due to changes in land stability, disturbance of acid sulfate soils or project-induced soil erosion over the short or long term	Direct effects within Victoria	
	Unlikely	<p>Areas of CASS identified in the Nearshore Cable Envelope include the nearby areas of Corner Inlet, Port Albert, Shoal Inlet, Freshwater Swamp, Mcloughlin's Beach Coastal Reserve, and Jack Smith Lake.</p> <p>Avoidance of impacts is possible through the siting of project infrastructure away from areas containing this community as well as the use of HDD or trenchless construction methods as appropriate. As a result, the overlap between the area of disturbance is likely to be small and impacts are avoidable and manageable with standard control measures. Extensive or major effects are not expected.</p>
	Indirect effects from activities in Commonwealth waters	

Referral Criteria	Referral Criteria Met?	Comments
	No	Indirect, downstream effects on coastal processes and coastal stability are unlikely to occur as a result of the presence of infrastructure in Commonwealth waters.
Potential for extensive or major effects on social or economic well-being due to direct or indirect displacement of non-residential land use activities	Direct effects within Victoria	
	Unlikely	Cable installation and shore crossing works will be temporary in nature and are not expected to have a lasting effect on land and sea users in Victoria. Certain demersal fishing methods or vessel anchoring may not be suitable along export cables, however, these linear features would not result in the displacement of fishers or boating from large areas and extensive or major effects on social or economic well-being are unlikely.
	Indirect effects from activities in Commonwealth waters	
	Unlikely	Potential indirect socio-economic effects from Project components in Commonwealth waters include effects to tourism and fisheries. However, given the distance offshore, limited fisheries effort in the OWF Site (refer Section 4.7.12.2 and Appendix B) and the potential for many types of fishing to be able to continue within the OWF Site, extensive or major effects on social or economic well-being are considered unlikely. Potential impacts will be assessed and managed through consultation and the EPBC referral process. It is possible that an unplanned fuel or chemical spill from a vessel, or unplanned introduction of IMS could impact social or economic well-being. However, such events are unlikely to occur given limited size of any construction/installation vessels, the implementation of legislation and standard control measures. Potential impacts from IMS and chemical or fuel spills will be assessed and mitigated through the EPBC referral process.

6. PROPOSED PROGRAM OF INVESTIGATIONS

6.1 BASELINE STUDIES AND IMPACT STUDIES

Recommended baseline studies are identified in **Table 6-1**. Recommended impact studies are identified in **Table 6-2**. Note some of these are underway, with the remainder currently being scoped. Following consultation with regulators, a study program for the environmental impact assessments will be provided to the regulators to inform scoping guidelines for the project.

TABLE 6-1 RECOMMENDED BASELINE STUDIES

Study	Study Objectives	Potential Methods Being Considered
Metocean/ Coastal Processes	<ul style="list-style-type: none"> Characterise the waves, currents and sediment transport within the OWF Site for engineering design and EIA purposes. The baseline existing literature will be assessed as part of the EIA process to determine the extent of surveys required to inform modelling studies for the EIA. 	<ul style="list-style-type: none"> Floating light detection and ranging (LiDAR) buoy Wave buoy Acoustic Doppler Current Profiler (ADCP)
Geophysical/ Geotechnical	<ul style="list-style-type: none"> Determine geophysical and geotechnical properties of seabed. Analyse data to inform interpretation of benthic habitats and potential cultural heritage (submerged paleo-landforms). 	<ul style="list-style-type: none"> Side Scan Sonar Multi-beam echosounder Sub-bottom profiler Core/grab samples Cone Penetration Test (CPT)
Water and sediment quality	<ul style="list-style-type: none"> Characterise the water and sediment quality and variability. Understand baseline conditions for marine ecological communities. Identify or rule out existing sources of contamination. 	<ul style="list-style-type: none"> Core/grab samples Water samplers Multi-parameter sensors
Benthic Habitats and Communities	<ul style="list-style-type: none"> Characterise and map the benthic habitats and communities present within the OWF Site and cable envelopes. Identify the potential presence of sensitive habitat and potential Threatened Ecological Communities to inform cable route and infrastructure locations. 	<ul style="list-style-type: none"> Benthic grab samples (seabed sediments and infauna) Towed video / ROV (epifauna) Benthic habitat mapping incorporating geophysical and benthic survey data
Fish Communities	<ul style="list-style-type: none"> Characterise the fish communities present within the OWF Site and cable envelopes. 	<ul style="list-style-type: none"> Baited remote underwater video survey (BRUVS) Beam trawl Fisheries catch census
Marine Fauna (Commenced February 2023)	<ul style="list-style-type: none"> Understand the presence, abundance and timing of marine fauna (cetaceans, fur seals, turtles) utilising the OWF Site. 	<ul style="list-style-type: none"> Aerial and boat-based surveys Tagging studies Acoustic surveys (Passive Acoustic Monitoring – PAM)
Bird surveys (Commenced February 2023)	<ul style="list-style-type: none"> Understand the presence, abundance and timing of seabirds, shorebirds and migratory land birds utilising the OWF Site. 	<ul style="list-style-type: none"> Aerial and boat-based surveys Tagging studies of key species Shore based monitoring at key colonies/nesting sites

Study	Study Objectives	Potential Methods Being Considered
	<ul style="list-style-type: none"> Improve understanding of the flight heights of seabirds and migratory shorebirds and land birds, where possible. 	

TABLE 6-2 RECOMMENDED IMPACT STUDIES

Study	Study Objectives	Potential Methods Being Considered
Underwater noise modelling	<ul style="list-style-type: none"> Define potential sound source levels associated with foundation installation and other key noise-producing activities during construction and operation Evaluate sound propagation and extent of potential effects to marine fauna. 	<ul style="list-style-type: none"> Numerical modelling – Acoustic source and sound propagation
Coastal processes modelling	<ul style="list-style-type: none"> Understand magnitude and extent of erosion and deposition around foundations. Understand potential extent of increased suspended sediment concentrations. Understand potential changes to waves and currents. 	<ul style="list-style-type: none"> Numerical modelling – Wind, waves currents, coastal morphology
Bird collision risk and population impact study	<ul style="list-style-type: none"> Understand the potential magnitude of collisions for key bird species' populations. 	<ul style="list-style-type: none"> Collision risk modelling Population impact modelling/predictions
Seascape, landscape and visual impact assessment	<ul style="list-style-type: none"> Identify sensitive viewpoint locations. Evaluate magnitude of visual change. 	<ul style="list-style-type: none"> Viewshed analysis (zone of visual influence) Baseline photos Ongoing stakeholder engagement Wireframe / photo montage of proposed turbine options
EMF effects study	<ul style="list-style-type: none"> Understand the potential EMF characteristics of the GEOW export cables Assess the potential effects to marine fauna (e.g. sharks) 	<ul style="list-style-type: none"> Desktop review and assessment
Light effects study	<ul style="list-style-type: none"> Assess risk of Project lighting during construction (e.g. vessels) and operations (aviation and maritime hazard lighting on turbines) on seabird colonies and sensitive shorebird habitat. 	<ul style="list-style-type: none"> Desktop review and assessment
Aviation Impact Assessment	<ul style="list-style-type: none"> Assessment of potential effects to aviation, radar and air traffic control. 	<ul style="list-style-type: none"> Desktop review Consultation with CASA and relevant aerodromes during the preparation of the Aviation Impact Assessment Aviation impact assessment

Study	Study Objectives	Potential Methods Being Considered
Shipping and Navigation Assessment	<ul style="list-style-type: none"> Assessment of the potential effects on safety of navigation for commercial and recreational vessels 	<ul style="list-style-type: none"> Desktop review Ongoing consultation with AMSA, DTP and regional port authorities to understand potential impacts on vessel movements and requirements for navigational markers, shipping fairways or traffic separation scheme mitigation. Assessment by subject matter expert
Fisheries	<ul style="list-style-type: none"> Assessment of potential effects on construction and operational activities on existing fisheries 	<ul style="list-style-type: none"> Desktop review Data collection on fisheries locations, effort and type Consultation with Commonwealth and state fisheries agencies, industry associations and other relevant fisheries stakeholders Explore opportunities for coexistence Assessment by subject matter expert
Social Impact Assessment	<ul style="list-style-type: none"> Identification of socio-economic uses within the marine environment. Assessment of potential social impacts. 	<ul style="list-style-type: none"> Stakeholder consultation Desktop assessment

7. CONCLUSION

This Preliminary Marine Assessment Report has provided a summary of the existing environment, as relevant to the OWF Site and the offshore cable envelopes, and presents the results of a preliminary impact assessment.

Commonwealth matters

The preliminary assessment of the Project against MNES identified the following potentially significant impacts:

- Listed Threatened and Migratory bird species – Collision risk and potential barrier effects could impact on populations and areas occupied by seabirds such as albatrosses and petrels, migratory shorebirds and migratory land birds.
- Listed Threatened and Migratory marine mammals – Underwater noise disturbance, including to foraging pygmy blue whales and migrating/resting/breeding southern right whales.
- Listed Threatened and Migratory fish species – Underwater noise and vibration from construction activities to impact white sharks within the breeding (nursery) BIA.
- Commonwealth Marine Area – Potential adverse effects on a population of a marine species, specifically, seabirds, shorebirds, migratory land birds, pygmy blue whales, southern right whales and white sharks.

With the implementation of appropriate management and mitigation measures, potential impacts to MNES can be managed to an acceptable level.

A referral for assessment under the EPBC Act is recommended.

State Matters

The self-assessment of EES referral criteria in relation to marine matters identified that the referral criteria are unlikely to be triggered.

Given the location of the OWF Site (18 km from the state waters boundary), direct impacts from construction and operation of the turbines will not occur. Potential indirect impacts have been assessed as unlikely to trigger the EES referral criteria. The potential for indirect effects will be assessed in detail and managed through the referral process under the EPBC Act.

Direct impacts from temporary cable installation activities and operations within State jurisdiction have also been assessed as unlikely to trigger the EES referral criteria. However, as a precautionary approach a referral for assessment under the EE Act is recommended. The Project will also consider the broader environmental context and potential for impacts against relevant State and Commonwealth legislation.

8. REFERENCES

- AEMC 2022. TAS: Tasmanian Gas Pipeline [website]. Available from:
[https://www.aemc.gov.au/energy-rules/national-gas-rules/gas-scheme-register/tas-tasmanian-gas-pipeline#:~:text=The%20Tasmanian%20Gas%20Pipeline%20\(TGP,300km%20of%20sub%2Dsea%20pipeline,](https://www.aemc.gov.au/energy-rules/national-gas-rules/gas-scheme-register/tas-tasmanian-gas-pipeline#:~:text=The%20Tasmanian%20Gas%20Pipeline%20(TGP,300km%20of%20sub%2Dsea%20pipeline,) accessed 16 June 2022.
- Amtstaetter F., Dawson D., O'Connor J. (2015) Improving our ability to collect eggs of the threatened Australian grayling, *Prototroctes maraena*. *Marine and Freshwater Research* 66, 1216-1219. <https://doi.org/10.1071/MF14277>
- Arnould, J.P.Y., & R. Kirkwood 2008. Habitat selection by female Australian fur seals (*Arctocephalus pusillus doriferus*). *Aquatic Conservation: Marine and Freshwater Ecosystems*. 17:S53-S67.
- Atlantis Fisheries Consulting Group 2023. Commercial Fishing Data, Corio Generation Limited, Great Eastern and Great Southern Windfarm Areas of Interest.
- Aulich, Meghan G., Robert D. McCauley, Benjamin J. Saunders, and Miles JG Parsons. 2019. "Fin whale (*Balaenoptera physalus*) migration in Australian waters using passive acoustic monitoring." *Scientific Reports* 9, no. 1: 1-12.
- Australian Hydrogeographic Office (AHO), 2020. Factsheet: Navigation. Maritime Military Firing Practice and Exercise Areas. Available from:
https://www.hydro.gov.au/factsheets/FS_Navigation-Firing_Practice_and_Exercise_Areas.pdf, accessed 10 June 2022.
- Backhouse, G., Jackson, J. and O'Connor, J. 2008. National Recovery Plan for the Australian Grayling *Prototroctes maraena*. Department of Sustainability and Environment, Melbourne. Available from:
<https://www.awe.gov.au/sites/default/files/documents/australian-grayling.pdf>, accessed 15 June 2022.
- Bannister, J.L., C.M. Kemper & R.M. Warneke 1996. The Action Plan for Australian Cetaceans. Canberra: Australian Nature Conservation Agency. Available from:
<http://www.environment.gov.au/resource/action-plan-australian-cetaceans>
- Barlow, D.R., Klinck, H., Ponirakis, D., Holt Colberg, M. and Torres, L.G., 2023. Temporal occurrence of three blue whale populations in New Zealand waters from passive acoustic monitoring. *Journal of Mammalogy*, 104(1): 29-38.
- Baylis AMM, Page B, Goldsworthy SD (2008) Colony-specific foraging areas of lactating New Zealand fur seals. *Marine Ecology Progress Series* 361:279-290.
<https://doi.org/10.3354/meps07258>
- Bouchet, P.J., Meeuwig, J.J., Wellard, R., Erbe, C. and Pattiaratchi, C.B., 2018. Bremer Canyon Emerging Priorities Project EP2: Final Report.
- Bruce, B., Bradford, R., Foster, S., Lee, K., Lansdell, M., Cooper, S. and Przeslawski, R. 2018 Quantifying fish behaviour and commercial catch rates in relation to a marine seismic survey. *Mar Environ Res*. 2018 Sep;140:18-30. doi: 10.1016/j.marenvres.2018.05.005. Epub 2018 May 22. PMID: 29853190.

- Bureau of Meteorology (BOM). 2019. Rose of Wind direction versus Wind speed in km/h (22 Apr 1943 to 06 Sep 2017), East Sale. Commonwealth of Australia. Available from: http://www.bom.gov.au/cgi-bin/climate/cgi_bin_scripts/windrose_selector.cgi?period=Annual&type=9&location=85072
- Butler, A., Harris, P., Lyne, V., Heap, A., Passlow, V., & Porter-Smith, R. 2001. An Interim Bioregionalisation for the continental slope and deeper waters of the South-East Marine Region of Australia. Report to the National Oceans Office, Geoscience Australia and CSIRO, Hobart.
- Bird Life Australia. 2020. A stocktake of recovery activities undertaken for the Orange-bellied Parrot (*Neophema chrysogaster*). Unpublished report for the Department of the Environment and Energy based on the views of Stakeholders and an Independent Review Panel.
- Chilvers, B.L. & Goldsworthy, S.D. 2015. *Arctocephalus forsteri*. The IUCN Red List of Threatened Species 2015: e.T41664A45230026. Available from: <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T41664A45230026.en>, accessed 10 June 2022.
- Chittleborough, R. G. (1965) Dynamics of two populations of the humpback whale, *Megaptera novaeangliae* (Borowski). Australian Journal of Marine and Freshwater Research 16: 33-128.
- Clapham, P.J. and Baker, C.S. 2002. Modern whaling. In: Perrin, W.F., Würsig, B. & Thewissen, J.G .M. (eds.), *Encyclopedia of Marine Mammals*, pp. 1328-1332. Academic Press, New York.
- Collins, P. 2004. Shallow Inlet Marine & Coastal Park: Site Information Sheet for nomination to join the East Asian-Australasian Shorebird Site Network. Australia, 8 October 2004.
- Commission for the Conservation of Southern Bluefin Tuna (CCSBT) 2011, Resolution on the Adoption of a Management Procedure. Adopted at the CCSBT Eighteenth Annual Meeting, 10-13 October 2011. Indonesia: CCSBT. Available from: http://www.ccsbt.org/userfiles/file/docs_english/operational_resolutions/Resolution_Management_Procedure.pdf, accessed 03 March 2022.
- Commonwealth of Australia, n.d.(a), Subtropical and Temperate Coastal Saltmarsh Conservation Advice, Department of Environment (DoE), Canberra. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf>, accessed 08 June 2022.
- Commonwealth of Australia, 2013a. Matters of National Environmental Significance: Significant Impact Guidelines 1.1. Department of Environment, Canberra. Available from: https://www.awe.gov.au/sites/default/files/documents/neg-guidelines_1.pdf. Accessed 10 June 2022.
- Commonwealth of Australia 2013b. Recovery Plan for the White Shark (*Carcharodon carcharias*). Department of Sustainability, Environment, Water, Population and Communities. Available from: <http://www.environment.gov.au/biodiversity/threatened/recovery-plans/recovery-plan-white-shark-carcharodon-carcharias>.

- Commonwealth of Australia, 2015a. South-east marine region profile: A description of the ecosystems, conservation values and uses of the South-east Marine Region, Department of the Environment 2015.
- Commonwealth of Australia 2015b. Wildlife Conservation Plan for Migratory Shorebirds. Department of the Environment 2015.
- Commonwealth of Australia 2017. Recovery Plan for Marine Turtles in Australia, Department of the Environment and Energy 2017. Available from: <https://www.awe.gov.au/sites/default/files/documents/recovery-plan-marine-turtles-2017.pdf>, accessed 10 June 2022.
- Commonwealth of Australia, 2022a. Megaptera novaeangliae in Species Profile and Threats Database. Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed 18/05/2022.
- Commonwealth of Australia 2022b. Lagenorhynchus obscurus in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed Wed, 18 May 2022 10:43:42 +1000.
- Commonwealth of Australia 2022c. Orcinus orca in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed 18 May 2022
- Commonwealth of Australia 2022d. Arctocephalus pusillus in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed 18 May 2022.
- Commonwealth of Australia 2022e, Prototroctes maraena in Species Profile and Threats Database, Australian Government, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?showprofile=Y&taxon_id=26179, accessed on 03 March 2022.
- Commonwealth of Australia 2022f, Seriolella brama in Species Profile and Threats Database, Australian Government, Canberra. Available at: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=69374, accessed 03 March 2022.
- Commonwealth of Australia 2022g, Thunnus maccoyii in Species Profile and Threats Database, Australian Government, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=69402, accessed 03 March 2022.
- Commonwealth of Australia 2022h, Carcharodon carcharias in Species Profile and Threats Database, Australian Government, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64470, accessed 03 March 2022.
- Commonwealth of Australia 2022i, Lamna nasus in Species Profile and Threats Database, Australian Government, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=83288, accessed 03 March 2022.
- Commonwealth of Australia 2022j, Galeorhinus galeus in Species Profile and Threats Database, Australian Government, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=68453, accessed 03 March 2022.

- Commonwealth of Australia 2022k, *Isurus oxyrinchus* in Species Profile and Threats Database, Australian Government, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=79073, accessed 03 March 2022.
- Commonwealth of Australia 2022l. *Rhincodon typus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed Wed, 18 May 2022 13:24:10 +1000.
- Commonwealth of Australia 2022m. National Recovery Plan for albatrosses and petrels. Department of Climate Change, Energy, the Environment and Water, Canberra.
- Commonwealth of Australia, 2023a. Directory of Important Wetlands in Australia - Information sheet. Jack Smith Lake State Game Reserve - VIC069.
- Commonwealth of Australia, 2023b. Directory of Important Wetlands in Australia - Information sheet. Lake Victoria Wetlands - VIC072
- Commonwealth of Australia, 2023c. Directory of Important Wetlands in Australia - Information sheet, Lake King Wetlands - VIC071.
- Commonwealth of Australia, 2023d. Guidance - Key environmental factors for offshore windfarm environmental impact assessment under the Environment Protection and Biodiversity Conservation Act 1999. Department of Climate Change, Energy, the Environment and Water, Canberra, July. CC BY 4.0.
- Connolly, R. 2009, Fish on Australian saltmarshes. In: Australian Saltmarsh Ecology. (ed.) N Saintilan. CSIRO Publishing, Victoria.
- Cooke, J.G. 2018. *Balaenoptera physalus*. The IUCN Red List of Threatened Species 2018:e.T2478A50349982. <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T2478A50349982.en>
- Dawbin, W. H. (1966) The seasonal migratory cycle of humpback whales. In: Whales, dolphins and porpoises (ed. K.S. Norris). University of California Press, Berkeley. pp. 145-171.
- Department of Agriculture, Water and Environment (DAWE) n.d, *Neophema chrysogaster* — Orange-bellied Parrot, Species Profile and Threats Database. Australian Government. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=747, accessed 01 February 2022.
- DAWE, 2021. Threatened ecological communities [website]. Australian Government, Canberra. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities>, accessed 02 March 2022.
- DCCEEW, 2024. National Recovery Plan for the Southern Right Whale, Department of Climate Change, Energy, the Environment and Water, Canberra.
- DoE, n.d.(b), Approved Conservation Advice (including listing advice) for the Natural Damp Grassland of the Victorian Coastal Plains, Australian Government, Canberra. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/133-conservation-advice.pdf>, accessed 08 June 2022.
- DoE, 2015c. Conservation Management Plan for the Blue Whale – A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999. Canberra, ACT: Commonwealth of Australia. Available from:

<http://www.environment.gov.au/biodiversity/threatened/publications/recovery/blue-whale-conservation-management-plan>.

Department of the Environment and Water Resources (DEW), 2007. National Whale and Dolphin Sightings and Strandings Database. Available from: http://aadcm.maps.aad.gov.au/aadc/whales/species_sightings.cfm?taxon_id=58, accessed: 12 July 2007.

Department of the Environment, Land, Water and Planning (DELWP), 2016. National Recovery Plan for the Orangebellied Parrot *Neophema chrysogaster*. Australian Government, Canberra.

Director of National Parks 2013, South-east Commonwealth Marine Reserves Network management plan 2013-23, Director of National Parks, Canberra.

Department of Natural Resources and Environment, 1996. Corner Inlet and Nooramunga Marine and Coastal Parks draft management plan. Department of Natural Resources and Environment, Melbourne, VIC.

Department of Primary Industries, Parks, Water and Environment (DPIPEW), 2015. Rodondo Island Bass Strait Biodiversity & Oil Spill Response Survey, January 2015. Nature Conservation Report Series 15/04. Available from: <https://nre.tas.gov.au/Documents/Rodondo%20Island%20OSRA%20report%20FINAL.pdf> accessed 10 June 2022.

Department of Primary Industries, Water and Environment (DPIPWE), 2000. SMALL BASS STRAIT ISLAND RESERVES DRAFT MANAGEMENT PLAN, October 2000. Available at: <https://parks.tas.gov.au/Documents/bassstraitpdf.pdf>

Department of Sustainability and Environment 2006, Ministerial guidelines for assessment of environmental effects under the EE Act 1978. State Government of Victoria. Available from: https://www.planning.vic.gov.au/__data/assets/pdf_file/0026/95237/DSE097_EES_FA.pdf

Department of Sustainability and Environment 2009, Action Statement No. 250. Available from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0025/32398/Leathery_Turtle_Dermochelys_coriacea.pdf, accessed 10 June 2022.

DELWP, n.d (c). Flora and Fauna Guarantee Act 1988 – Threatened List: Characteristics of Threatened Communities, State Government of Victoria. Available from: https://www.environment.vic.gov.au/__data/assets/pdf_file/0018/50418/04072019-Flora-and-Fauna-Guarantee-Characteristics-of-Threatened-Communities-3.pdf, accessed 06 May 2022.

Department of Sustainability and Environment, 2009. Leathery Turtle *Dermochelys coriacea*, Victorian Government, Melbourne. Available at: https://www.environment.vic.gov.au/__data/assets/pdf_file/0025/32398/Leathery_Turtle_Dermochelys_coriacea.pdf, accessed 03 March 2022.

Director of National Parks (DNP), 2013. South-east Commonwealth Marine Reserves Network management plan 2013-23, Director of National Parks, Canberra.

- DSEWPac 2012. Conservation Management Plan for the Southern Right Whale. A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999, 2011–2021
- DSEWPac 2011a. Corner Inlet Ramsar Site Ecological Character Description. Australian Government, Canberra. Available from: <https://www.awe.gov.au/sites/default/files/env/resources/97f19db6-cc7c-429b-9431-7577f1d99907/files/13-ecd.pdf>, accessed 10 June 2022.
- DSEWPac 2011b. Gippsland Lakes Ramsar Site Ecological Character Description. Australian Government, Canberra. Available from: <https://www.awe.gov.au/sites/default/files/env/resources/0c0185c8-8e0b-4194-a6ca-d0f795bef410/files/21-ecd.pdf>, accessed 10 June 2022.
- Durrant, T., Hemer, M., Trenham, C. and Greenslade, D. 2013. CAWCR Wave Hindcast 1979–2010. v10. CSIRO. Service Collection. Available from: <http://hdl.handle.net/102.100.100/13165?index=1>
- East Gippsland Catchment Management Authority. 2015. Gippsland Lakes Ramsar Site Management Plan: Summary Report. Bairnsdale, Victoria.
- ECC 2000, Marine, Coastal and Estuarine Investigation Final Report. Environment Conservation Council, East Melbourne.
- Ehmke, G. 2009. Potential occurrence and optimal habitat models for the orange-bellied parrot in south-eastern mainland Australia. Melbourne: BirdLife Australia.
- Ehmke, G. and Tzaros, C., 2009. Assessments of Orange-bellied parrot non-breeding foraging habitat (2006–2007). Birds Australia, Melbourne.
- Ensor, P., K. Sekiguchi, J. Cotton, R. Huckle-Gaete, T. Kariya, H. Komiya, D. Ljungblad, H. Marite, P. Olson & S. Rankin 2002. 2001–2002 IWC-Southern Ocean Whale and Ecosystem Research (IWC-SOWER) Circumpolar Cruises, Area V. Available from the IWC secretariat. Cambridge, UK - unpublished.
- Environmental Resources Management (ERM) 2024a. Great Eastern Offshore Wind: Preliminary Terrestrial Ecology Report.
- Environmental Resources Management (ERM) 2024b. Great Eastern Offshore Wind: Heritage Constraints Assessment.
- FishingMad 2021, Wilson's Prom [website]. Available at: <https://fishingmad.com.au/location/wilsons-prom>, accessed 02 February 2022.
- Foord CS, Rowe KMC, Robb K 2019. Cetacean biodiversity, spatial and temporal trends based on stranding records (1920–2016), Victoria, Australia. PLoS ONE 14(10): e0223712. <https://doi.org/10.1371/journal.pone.0223712>
- Francis, M., L. Natanson & S. Campana (2002). The Biology and Ecology of the Porbeagle Shark, *Lamna nasus*. In: Camhi, M., E. Pikitch & E. Babcock, eds. Sharks of the Open Ocean: Biology, Fisheries and Conservation. p105–113. Blackwell Publishing, United Kingdom.
- Fugro Australia Marine Pty Ltd (Fugro) 2022. Corio Generation – Great Eastern Offshore Wind Desk Study, November 2022.

- Gibbens, J. and Arnould, J.P., 2009. Interannual variation in pup production and the timing of breeding in benthic foraging Australian fur seals. *Marine Mammal Science*, 25(3), pp.573-587.
- Gill, P.C. 2002. A blue whale (*Balaenoptera musculus*) feeding ground in a southern Australian coastal upwelling zone. *Journal of Cetacean Research and Management*. 4:179-184.
- Gill, P.C., Ross, G.J.B., Dawbin, W.H., Wapstra, H., 2000. Confirmed sightings of dusky dolphins (*Lagenorhynchus obscurus*) in southern Australian waters. *Marine Mammal Science* 16(2): 452-459.
- Gill, P. C. et al. 2011. Blue whale habitat selection and within-season distribution in a regional upwelling system off southern Australia. *Mar. Ecol. Prog. Ser.* 421, 243–263.
- Gill, P.C., R. Pirzl, M.G. Morrice & K. Lawton 2015. Cetacean diversity of the continental shelf and slope off southern Australia. *The Journal of Wildlife Management*.
- Gill, P.C., Kemper, C.M., Talbot, M. and Lyons, S.A., 2008. Large group of pygmy right whales seen in a shelf upwelling region off Victoria, Australia. *Marine mammal science*, 24(4), pp.962-968.
- Greening Australia 2016. The cultural story of the Lake Wellington wetlands [website]. Available at: <https://www.greeningaustralia.org.au/the-cultural-story-of-the-lake-wellington-wetlands/#:~:text=The%20fringing%20wetlands%20of%20the,Bittern%20and%20over%20seven%20species>, accessed 30 May 2022.
- Hansen Partnership. 2023. Great Eastern Offshore Wind Project – Preliminary Visual Appraisal. Prepared for Corio Generation, February 2023.
- Harris, P., Heap, A., Passlow, V., Sbaffi, L. Fellows, M., Porter-Smith, R., Buchanan, C. and Daniell, J. 2005. Geomorphic Features of the Continental Margin of Australia. *Geoscience Australia, Record 2003/30*, 142pp.
- Hedley S.L., Bannister, J.L. and Dunlop, R.A. 2011. Abundance estimates of Southern Hemisphere Breeding Stock 'D' Humpback Whales from aerial and land-based surveys off Shark Bay, Western Australia, 2008. *Journal of Cetacean Research and Management (Special Issue)* 3,209-221.
- Holdsworth M. C. 2006. Reproductive success and demography of the Orange-bellied Parrot *Neophema chrysogaster*. Masters Thesis, University of Tasmania. Available at: <https://eprints.utas.edu.au/1042/>, accessed 01 February 2022.
- Hutchison Z.L., Sigray, P., He, H., Gill, A.B, King, J. and Gibson, C. 2018. Electromagnetic Field (EMF) Impacts on Elasmobranch (shark, rays, and skates) and American Lobster Movement and Migration from Direct Current Cables. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2018-003.
- IUCN 2022, Shortfin Mako: *Isurus oxyrinchus*. Available at: <https://www.iucnredlist.org/species/39341/2903170>, accessed 03 March 2022.
- Institute for Marine and Antarctic Studies, n.d., About Seamap Australia. Available from: <https://seamapaustalia.org/about/>, accessed 31 January 2022.

- (IWC) International Whaling Commission., 2013. Report of the IWC Workshop on the Assessment of Southern Right whales. Journal of Cetacean Research and Management. 14(Supp.):439-461.
- Jackson, P., and Koehn, J. 1988. A review of biological information, distribution and status of the Australian grayling (*Prototroctes maraena*) Günther in Victoria. Arthur Rylah Institute for Environmental Research Technical Report Series No. 52. Conservation Forests and Lands, Melbourne.
- Jenner, K.C.S., Jenner, M-N.M., McCabe, K.A., 2001. Geographical and temporal movements of humpback whales in Western Australian waters. APPEA Journal, 2001: 741-765.
- Kavet, R., Wyman, M., Klimley, A. and Vergara, X. 2016. Assessment of Potential Impact of Electromagnetic Fields from Undersea Cable on Migratory Fish Behavior. Report by Electric Power Research Institute (EPRI).
- Kemper, C.M., 2002. Distribution of the pygmy right whale, *Caperea marginata*, in the Australasian region. Marine Mammal Science, 18(1), pp.99-111.
- Kemper, C. M., J. F. Middleton, and P. D. van Ruth. 2013. "Association between pygmy right whales (*Caperea marginata*) and areas of high marine productivity off Australia and New Zealand." New Zealand Journal of Zoology 40, no. 2: 102-128.
- Kirkwood, R., D. Pemberton, R. Gales, A.J. Hoskins, T. Mitchell, P.D. Shaughnessy & J.P.Y. Arnould 2010. Continued population recovery by Australian fur seals. Marine and Freshwater Research. 61:695-701.
- Ling, J.K. 1991. Recent Sightings of Killer Whales, *Orcinus orca* (Cetacea: Delphinidae), in South Australia. Transactions of the Royal Society of South Australia. 115:95-98.
- Littnan, C.L. & J.P.Y. Arnould 2002. At-sea movements of female Australian fur seals, *Arctocephalus pusillus doriferus*. Australian Mammalogy. 24:65-72.
- Lyle, J.M. & S.T. Willcox 2008. Dolphin and seal interactions with mid-water trawling in the Commonwealth Small Pelagic Fishery, including an assessment of bycatch mitigation strategies - R05/0996. Australian Fisheries Management Authority.
- McCauley, R. D., Gavrilov, A. N., Jolliffe, C. D., Ward, R. & Gill, P. C. 2018. Pygmy blue and Antarctic blue whale presence, distribution and population parameters in southern Australia based on passive acoustics. Deep-Sea Res. II 157–158, 154–168 2018.
- McCarthy D.J. 2012. Notes on OBP Migration. Unpublished Report
- McSweeney, S.L. 2020. Temporal and spatial variability of the open coast wave climate of Victoria, Australia. Marine and Freshwater Research 71: 394–413.
- Miller, B.S., Kelly N., Double, M.C., Childerhouse, S.J., Laverick, S. and Gales, N. 2012. "Cruise report on SORP 2012 blue whale voyages: Development of acoustic methods." Rep Submitt Sci Comm Int Whal Comm 64: 16.
- 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. Scientific Reports 10: 21165
- Monk J, Williams J, Barrett N, Jordan A, Lucieer V, Althaus F, Nichol S (2017). Biological and habitat feature descriptions for the continental shelves of Australia's temperate-water

- marine parks- including collation of existing mapping in all AMPs. Report to the National Environmental Science Programme, Marine Biodiversity Hub. Institute of Marine and Antarctic Studies, University of Tasmania.
- Morrice, M.G, P.C. Gill, J. Hughes & A.H. Levings 2004. Summary of aerial surveys conducted for the Santos Ltd EPP32 seismic survey, 2-13 December 2003. Report # WEG-SP 02/2004, Whale Ecology Group-Southern Ocean, Deakin University. unpublished.
- Museum Victoria, 2022, Bunurong Marine National Park Field Guide [app], available at: <https://museums victoria.com.au/apps/bunurong-marine-national-park-field-guide-app/#:~:text=This%20app%20presents%20images%20and,National%20Park%20and%20nearby%20waters>, accessed 02 February 2022.
- National Environmental Science Programme. (NESP). 2017. Port Jackson sharks assemble among the sponge gardens of Beagle Commonwealth Marine Reserve [News Item], Marine Biodiversity Hub. Available from: <https://www.nespmarine.edu.au/news/port-jackson-sharks-assemble-among-sponge-gardens-beagle-commonwealth-marine-reserve>
- National Oceans Office, 2002. Sea Country: An Indigenous Perspective – The South-east Regional Marine Plan Assessment Reports. National Oceans Office, Hobart.
- Noad MJ, Kniest E, Dunlop RA. 2019. Boom to bust? Implications for the continued rapid growth of the eastern Australian humpback whale population despite recovery. *Popul Ecol.* 61:198–209. <https://doi.org/10.1002/1438-390X.1014>
- Normandeau, E., Tricas, T. and Gill, A. 2011. Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09.
- NRE. 2002. Corner Inlet Ramsar Site: Strategic Management Plan, Department of Natural Resources and Environment, East Melbourne.
- Orange-bellied Parrot Recovery Team (2006), Department of Primary Industries and Water (DPIW), Hobart. Available at: <https://cdn.environment.sa.gov.au/environment/docs/pa-rec-orange-belliedparrot.pdf>, accessed 01 February 2022.
- Pade, N., N. Queiroz, N. Humphries, M. Witt, C. Jones, L. Noble & D. Sims (2009). First results from satellite-linked archival tagging of Port Phillip shark, *Lamna nasus*: area fidelity, wider-scale movements and plasticity in diel depth changes. *Journal of Experimental Marine Biology and Ecology.* 370:64-74.
- Parks Australia, 2022, Beagle Marine Park [website], Commonwealth of Australia. Available from: <https://parksaustralia.gov.au/marine/parks/south-east/beagle/>, accessed 08 June 2022.
- Parks Victoria, n.d, Wilsons Promontory Marine National Park [website], State Government of Victoria. Available from: <https://www.parks.vic.gov.au/places-to-see/parks/wilsons-promontory-marine-national-park#:~:text=Wilsons%20Promontory%20Marine%20National%20Park%20is%20hom>

- e%20to%20one%20of,Groper%2C%20and%20schools%20of%20Berber, accessed 02 February 2022.
- Parks Victoria 2022, Marine Protected Areas [website], State Government of Victoria. Available from: <https://www.parks.vic.gov.au/get-into-nature/conservation-and-science/conserving-our-parks/marine-protected-areas>, accessed 01 February 2022.
- Parks Victoria. 2008. Lake Wellington Wetlands Management Plan November 2008, Parks Victoria, Melbourne. Available online at: <https://www.yumpu.com/en/document/read/11940033/lake-wellington-wetlands-management-plan-pdf-parks-victoria>, accessed 09 June 2022.
- Parks Victoria. 2006a. Ninety Mile Beach Marine National Park Management Plan, Parks Victoria, Melbourne.
- Parks Victoria 2006b, Wilsons Promontory Marine National Park and Wilsons Promontory Marine Park Management Plan, Parks Victoria, Melbourne
- Parks Victoria. 2005. Corner Inlet Marine National Park management plan, Parks Victoria, Melbourne.
- Parks Victoria, 2002. Wilsons Promontory National Park management plan. Parks Victoria, Melbourne.
- Pierce, S.J. & Norman, B. 2016. Rhincodon typus. The IUCN Red List of Threatened Species 2016: e.T19488A2365291. <https://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T19488A2365291.en>. Accessed on 18 May 2022.
- Popper, A.N., Hawkins, A.D., Fay, R., Mann, D., Bartol, S., Carlson, T., Coombs, S., Ellison, W., Gentry, R., Halvorsen, M., Løkkeborg, S., Rogers, P., Southall, B., Zeddies, D. and Tavalga, W. 2014. Sound exposure guidelines for fishes and sea turtles: a technical report Prepared by ANSI-Accredited Standards Committee S3/SC1 and Registered with ANSI. 978-3-319-06658-5. Springer International Publishing, New York, USA.
- Premier of Victoria, 2022, New Orange-Bellied Parrots Join Record Flock [website]. Available from: <https://www.premier.vic.gov.au/new-orange-bellied-parrots-join-record-flock>, accessed 10 June 2022.
- Rampant, P., Crawford, D., Boyle, G., Ryan, S. and Robinson, N. 2003. Acid Sulfate Soil Hazard Maps: Guidelines for Coastal Victoria. CLPR Research Report No. 12, State of Victoria, March 2003.
- Reid, K., Baker, G.B., Woehler, E. 2022, Impacts on birds from Offshore Wind Farms in Australia, Department of Climate Change, Energy, the Environment and Water, Canberra,. CC BY 4.0.
- Rodríguez, A., Moffett, J., Revoltós, A., Wasiak, P., McIntosh, R.R., Sutherland, D.R., Renwick, L., Dann, P. and Chiaradia, A., 2017. Light pollution and seabird fledglings: targeting efforts in rescue programs. The Journal of Wildlife Management, 81(4), pp.734-741.
- Ross, G. J. B, 2006. Review of the Conservation Status of Australia's Smaller Whales and Dolphins. Department of the Environment and Heritage. Available from: <https://www.agriculture.gov.au/sites/default/files/documents/conservation-smaller-whales-dolphins.pdf>

- Salgado Kent, C., Jenner, C., Jenner, M., Bouchet, P. and Rexstad, E., 2012. Southern Hemisphere breeding stock'D'humpback whale population estimates from North West Cape, Western Australia. *Journal of Cetacean Research and Management*, 12(1), pp.29-38.
- Sandery, P. A., and Kampf, J. 2005. Winter-spring flushing of Bass Strait, south-eastern Australia: a numerical modelling study. *Estuarine, Coastal and Shelf Science* 63, 23–31.
- Shaughnessy, P. D., & Goldsworthy, S. D. (2020). Dispersion of long-nosed fur seals (*Arctocephalus forsteri*) determined by tagging. *Australian Journal of Zoology*, 67(3), 173-179
- Shaughnessy, P. D., S. D. Goldsworthy, and A. I. Mackay. "The long-nosed fur seal (*Arctocephalus forsteri*) in South Australia in 2013–14: abundance, status and trends." *Australian Journal of Zoology* 63.2 (2015): 101-110.
- Sherwood J; Chidgey S; Crockett P; Gwyther D; Ho P; Stewart S; Strong D; Whitely B; Williams A. 2016. Installation and operational effects of a HVDC submarine cable in a continental shelf setting: Bass Strait, Australia. *Journal of Ocean Engineering and Science*, 1, 2016. 337-353.
- Site Information Sheet, 2004, Site Information Sheet for nomination to join the East Asian-Australasian Shorebird Site Network, Shallow Inlet Marine & Coastal Park. Available at: https://www.water.vic.gov.au/__data/assets/pdf_file/0022/52942/Shallow-Inlet-Shorebird-Site-Information-Sheet.pdf, accessed 09 June 2022.
- Seafood Industry Victoria (SIV), n.d. Inshore Trawl Fishery [website]. Available from: <https://www.siv.com.au/inshore-trawl-fishery.html>, accessed 10 June 2022.
- Smith J.N., Jones D., Travouillon K., Kelly N., Double M. & Bannister, J.L. 2021. Monitoring Population Dynamics of 'Western' Right Whales off Southern Australia 2018-2021 - Final Report on activities for 2020. Report to the National Environmental Science Program, Marine Biodiversity Hub. Western Australian Museum (lead organisation).
- Smythe, T., Bidwell, D., & Tyler, G., 2021. Optimistic with reservations: The impacts of the United States' first offshore wind farm on the recreational fishing experience. *Marine Policy*, 127: 104440. <https://doi.org/10.1016/j.marpol.2021.104440>
- Speakman, Cassie N., Andrew J. Hoskins, Mark A. Hindell, Daniel P. Costa, Jason R. Hartog, Alistair J. Hobday, and John PY Arnould. 2020. "Environmental influences on foraging effort, success and efficiency in female Australian fur seals." *Scientific reports* 10, no. 1: 1-16.
- Stamaton K., Watson M., Moloney P., Charlton C. and Bannister, J. 2020. Population estimate and rate of increase of southern right whales *Eubalaena australis* in southeastern Australia. *Endangered Species Research* 41: 373-383.
- SWIFFT State Wide Integrated Flora and Fauna Teams, 2021a. Humpback whale. Available at: https://www.swifft.net.au/cb_pages/sp_humpback_whale.php
- SWIFFT State Wide Integrated Flora and Fauna Teams, 2021b. Southern right whale research and monitoring project. Available at:

http://www.swifft.net.au/cb_pages/team_southern_right_whale_south_eastern_australia_monitoring.php .

Tasmania Parks and Wildlife Service (PWS), 2021. Marine Reserves [website]. Available at: <https://parks.tas.gov.au/explore-our-parks/marine-reserves>, accessed 13 May 2022.

Tasmania Parks and Wildlife Service (PWS), 2009. Visiting – Kent Group National Park - Deal Island. State of Tasmania, February 2009.

Tasmanian Parks and Wildlife Service (PWS), 2000. Small Bass Strait Island Nature Reserves - Draft Management Plan, October 2000

Threatened Species Scientific Committee (TSSC), 2021. Listing advice Megaptera novaeangliae humpback whale. Commonwealth of Australia. Available at: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/38-listing-advice-26022022.pdf>

Threatened Species Scientific Committee (TSSC), 2015a. Conservation Advice for the Humpback Whale (Megaptera novaeangliae). Department of Environment, 2015.

Threatened Species Scientific Committee (TSSC), 2015b. Conservation Advice Rhincodon typus whale shark. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/66680-conservation-advice-01102015.pdf>. In effect under the EPBC Act from 01-Oct-2015.

Threatened Species Scientific Committee (TSSC), 2015c, Listing Advice Seriolella brama blue warehou. Available at: <https://www.environment.gov.au/biodiversity/threatened/species/pubs/69374-listing-advice.pdf>, accessed 03 March 2022.

Tjørnløv, R.S., Skov, H., Armitage, M., Barker, M., Jørgensen, J.B., Mortensen, L.O., Thomas, K. and Uhrenholdt, T. 2023. Resolving Key Uncertainties of Seabird Flight and Avoidance Behaviours at Offshore Wind Farms - Final Report for the study period 2020-2021. Prepared for Vattenfall, 20 February 2023.

Victorian Fishery Authority (VFA) 2021a, Fishery Overview. Rock Lobster [website]. Available from: <https://vfa.vic.gov.au/commercial-fishing/commercial-fisheries/rock-lobster/fishery-overview>, accessed 02 February 2022.

VFA 2021b, Abalone (all species). Shellfish [website]. Available from: <https://vfa.vic.gov.au/recreational-fishing/recreational-fishing-guide/catch-limits-and-closed-seasons/types-of-fish/shellfish/abalone-all-species>, accessed 02 February 2022.

VFA 2021c, Rock lobster. Commercial Fisheries [website]. Available from: <https://vfa.vic.gov.au/commercial-fishing/commercial-fisheries/rock-lobster>, accessed 02 February 2022.

VFA 2021d, Scallop. Commercial fisheries [website] Available from: https://vfa.vic.gov.au/commercial-fishing/commercial-fisheries/scallop#fishery_overview, accessed 03 June 2022.

VFA 2021e, Wrasse. Commercial fisheries [website]. Available from: <https://vfa.vic.gov.au/commercial-fishing/commercial->

fisheries/wrasse#:~:text=The%20Victorian%20Wrasse%20(Ocean)%20Fishery,offshore%2C%20except%20for%20marine%20reserves. Accessed 10 June 2022.

Victorian National Parks Association (VNPA) 2016, Victoria's Marine Parks and Sanctuaries, Available from: <https://vnpa.org.au/wp-content/uploads/2017/02/Pr-M-Fact-sheet-Marine-national-parks.pdf>, accessed 01 February 2022.

Victorian Regional Channels Authority 2021, Vic Tides 2021 Tide Table, Edition 5.

Walker, T. 2001. Basslink project review of impacts of high voltage direct current sea cables and electrodes on chondrichthyan fauna and other marine life, Basslink Supporting Study No 29, Marine and Freshwater Resources Institute No 20, 68 pp.

Warneke, R.M., 1995. Humpback whale. In: Menkhorst, P.W. (ed.). Mammals of Victoria; distribution, ecology and conservation. Oxford University Press, Oxford, UK.

Watkins, D. 1993. A National Plan for Shorebird Conservation in Australia. Australian Wader Studies Group. Royal Australian Ornithologists Union and World Wide Fund for Nature, Australia.

Wellard, R., Erbe, C., 2017. Killer Whales of the Bremer Sub-Basin: A photo-ID catalogue. Centre for Marine Science and Technology, Curtin University.

Wellard, R., Lightbody, K., Fouda, L., Blewitt, M., Riggs, D. and Erbe, C., 2016. Killer whale (*Orcinus orca*) predation on beaked whales (*Mesoplodon* spp.) in the Bremer Sub-Basin, Western Australia. PloS one, 11(12), p.e0166670.

White, M., Menkhorst, P., Griffioen, Green, B., Salkin, O. and Pritchard, R., 2016. Orange-bellied Parrot: A retrospective analysis of winter habitat availability, 1985-2015. Arthur Rylah Institute for Environmental Research Technical Report Series Number 277. Department of Environment, Land, Water and Planning, Heidelberg, Victoria. Available at: https://www.ari.vic.gov.au/__data/assets/pdf_file/0022/64390/ARI-Technical-Report-277-Orange-bellied-parrot-retrospective-analysis-of-winter-habitat-availability-1985-2015.pdf, accessed 01 February 2022.



APPENDIX A

EPBC ACT PROTECTED MATTERS SEARCHES



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 03-Sep-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

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:	39
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:	64
Whales and Other Cetaceans:	14
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:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	12
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	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In feature area
Commonwealth Marine Areas (EPBC Act)	In feature 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	Buffer Status
BIRD			
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature 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	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
FISH			
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area	In feature 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	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Listed Migratory Species [Resource Information]			
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In buffer area only
Ardeenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardeenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]		
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In feature area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Fish			
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In feature area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area	In feature area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In feature area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area	In feature area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area	In feature area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area	In feature area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area	In feature area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area	In feature area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Arctocephalus forsteri			
Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area
Arctocephalus pusillus			
Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area	In feature area
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Whales and Other Cetaceans [Resource Information]			
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Caperea marginata			
Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]	Endangered	Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]		Species or species habitat known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In feature area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	Buffer Status
Beagle	Multiple Use Zone (IUCN VI)	In buffer area only

Extra Information

EPBC Act Referrals [Resource Information]				
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision	In feature area
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed	In feature area
Greater Gippsland Offshore Wind Project	2022/09379		Assessment	In feature area
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed	In feature area
Preliminary Site Investigations for Great Eastern Offshore Wind Project	2024/09890		Referral Decision	In feature area
Controlled action				
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued	In feature area
Not controlled action				
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur	In feature area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur	In feature area
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur	In feature area
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur	In feature area
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur	In feature area
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur	In feature area
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur	In feature area
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur	In feature area
Sharks			
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur	In feature area
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur	In buffer area only
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present	In feature area

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.

[© Commonwealth of Australia](#)

Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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-Sep-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

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	2
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	82
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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	88
Whales and Other Cetaceans:	14
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:	2
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	17
Key Ecological Features (Marine):	None
Biologically Important Areas:	11
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)

[Resource Information]

Ramsar Site Name	Proximity
Corner inlet	Within 10km of Ramsar site
Gippsland lakes	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
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

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 likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely 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 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
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	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
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat 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 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 likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely 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

Scientific Name	Threatened Category	Presence Text
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 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
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
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may 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
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 likely 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
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may 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
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
FISH		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	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
FROG		
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 likely to occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat may occur within area
MAMMAL		

Scientific Name	Threatened Category	Presence Text
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 likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely 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 may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	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	Foraging, feeding or related behaviour may 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
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	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
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat likely to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	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 likely to 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 likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to 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 likely to occur within area

REPTILE

Scientific Name	Threatened Category	Presence Text
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 likely to occur within area

SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known 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		
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 may 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	Species or species habitat may 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 borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely 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	Breeding 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	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 may 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
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
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely 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 likely 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 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]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
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
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 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
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 known 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

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely 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
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 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

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
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		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 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

Scientific Name	Threatened Category	Presence Text
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 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]		Species or species habitat 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 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	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
Merops ornatus Rainbow Bee-eater [670]		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 likely 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat 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
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within 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 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	Species or species habitat may occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may 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 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 known 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

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 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 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
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		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 Long-snout 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	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
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 borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely 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
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
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may 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
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

Current Scientific Name	Status	Type of Presence
Tursiops truncatus s. str.		
Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Jack Smith Lake W.R	Natural Features Reserve	VIC
Ninety Mile Beach	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
Gippsland RFA	Victoria

Nationally Important Wetlands	[Resource Information]
Wetland Name	State
Jack Smith Lake State Game Reserve	VIC

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision	
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed	
Greater Gippsland Offshore Wind Project	2022/09379		Assessment	
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed	
Preliminary Site Investigations for Great Eastern Offshore Wind Project	2024/09890		Referral Decision	
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed	

Title of referral	Reference	Referral Outcome	Assessment Status
Seadragon Offshore Wind Farm	2022/9163		Completed
Controlled action			
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Not controlled action			
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	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
Not controlled action (particular manner)			
Bream 3D seismic survey	2006/2556	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
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Biologically Important Areas			[Resource Information]
Scientific Name		Behaviour	Presence
Seabirds			
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
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]		Breeding (nursery area)	Known to occur
Whales			
Balaenoptera musculus brevipinna			
Pygmy Blue Whale [81317]		Foraging	Likely to be present
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.

[© Commonwealth of Australia](#)

Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111



Australian Government

Department of Climate Change, Energy,
the Environment and Water

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-Sep-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

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	2
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	80
Listed Migratory Species:	52

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:	88
Whales and Other Cetaceans:	11
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:	1
EPBC Act Referrals:	14
Key Ecological Features (Marine):	None
Biologically Important Areas:	10
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	
Corner inlet	Within 10km of Ramsar site	
Gippsland lakes	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)	

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
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

Listed Threatened Species		[<u>Resource Information</u>]
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 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
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely 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 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
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	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
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat 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

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 likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely 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 may occur within area

Scientific Name	Threatened Category	Presence Text
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
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	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 likely to occur within area

Scientific Name	Threatened Category	Presence Text
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
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may 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
FISH		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat may 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
FROG		
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 likely to occur within area
Uperoleia martini Martin's Toadlet [1873]	Endangered	Species or species habitat may occur within area
MAMMAL		
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat 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 may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	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	Foraging, feeding or related behaviour may 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
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	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
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Glycine latrobeana Clover Glycine, Purple Clover [13910]	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 likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat may occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to 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 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 likely to occur within area
SHARK		

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known 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		
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
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
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 may 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	Species or species habitat may 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 musculus Blue Whale [36]	Endangered	Species or species habitat 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	Breeding 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	Species or species habitat known to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may 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
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
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely 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
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 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 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
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 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
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

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]		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 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
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 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]		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
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		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 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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat 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]		Species or species habitat 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

Scientific Name	Threatened Category	Presence Text
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
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 likely 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat 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

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within 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 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	Species or species habitat may occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may 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
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 known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
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
Leptoichthys fistularius Brushtail Pipefish [66248]		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
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		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
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 Long-snout 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	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
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 musculus Blue Whale [36]	Endangered	Species or species habitat likely to 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
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may 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
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

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Jack Smith Lake W.R	Natural Features Reserve	VIC	
Lake Denison W.R	Natural Features Reserve	VIC	
Ninety Mile Beach	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
Gippsland RFA	Victoria

Nationally Important Wetlands	[Resource Information]
Wetland Name	State
Jack Smith Lake State Game Reserve	VIC

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Blue Marlin Offshore Wind Energy Project	2023/09532		Referral Decision	
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed	
Greater Gippsland Offshore Wind Project	2022/09379		Assessment	
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed	
Preliminary Site Investigations for Great Eastern Offshore Wind Project	2024/09890		Referral Decision	

Title of referral	Reference	Referral Outcome	Assessment Status
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed
Controlled action			
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Not controlled action			
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	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
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval

Biologically Important Areas		[Resource Information]
Scientific Name	Behaviour	Presence
Seabirds		
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	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]	Breeding (nursery area)	Known to occur

Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present

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.

[© Commonwealth of Australia](#)

Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111



APPENDIX B

COMMERCIAL FISHERIES POTENTIALLY ACTIVE WITHIN THE OWF SITE AND CABLE ENVELOPES

Commercial Fisheries

Fishery	Extent of Management Area	Key Target Species	Gear Type/Method	Fishing Season	Potential for coexistence
Commonwealth-Managed Fisheries					
SESSF Commonwealth Trawl Sector - Demersal Otter Trawl	The Commonwealth Trawl Sector (CTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF) extends south from Fraser Island off Queensland to east of Kangaroo Island off South Australia (ABARES, 2020).	Target a variety of fish and shark species. The main species landed in the 2022-23 fishing season included Blue grenadier, Flathead, Orange roughy, Pink ling and Eastern school whiting.	Predominately Demersal otter trawl. Pair trawling and midwater trawling methods are also permitted under the SESSF management plan but are rarely used (ABARES, 2023).	1 May to 30 April	Demersal trawl is not compatible as a result of HSE issues and damage to cables. Midwater trawling is potentially compatible, but uncertain therefore some risk depending on the size of trawl.
SESSF Commonwealth Trawl Sector- Danish seine sub-sector	The Commonwealth Trawl Sector (CTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF) extends south from Fraser Island off Queensland to east of Kangaroo Island off South Australia (ABARES, 2020).	Target a variety of fish and shark species. The main species landed in the 2022-23 fishing season included Blue grenadier, Flathead, Orange roughy, Pink ling and Eastern school whiting.	Danish-seine fishing methods. Pair trawling and midwater trawling methods are also permitted under the SESSF management plan but are rarely used (ABARES, 2023).	1 May to 30 April	Danish-seine netting is assumed not compatible on a large scale. Midwater trawling is potentially compatible, but uncertain therefore some risk depending on the size of trawl.
SESSF Shark Gillnet (SSKN)	extend south from the New South Wales – Victoria border, around Tasmania, and west to the South Australia – Western Australia border.	Target gummy shark (<i>Mustelus antarcticus</i>). School shark (<i>Galeorhinus galeus</i>), elephantfish (<i>Callorhinchus milii</i>) and sawsharks (<i>Pristiophorus cirratus</i> and <i>P. nudipinnis</i>) are byproducts of fishing for gummy sharks.	Demersal gillnet		Gillnets are potentially compatible with offshore wind farms, to some degree. However, gillnets are still at some risk, depending on the size on the nets.
SESSF Shark Hook Sector	extend south from the New South Wales – Victoria border, around Tasmania, and west to the South Australia – Western Australia border.	Target gummy shark (<i>Mustelus antarcticus</i>). School shark (<i>Galeorhinus galeus</i>), elephantfish (<i>Callorhinchus milii</i>) and sawsharks (<i>Pristiophorus cirratus</i> and <i>P. nudipinnis</i>) are byproducts of fishing for gummy sharks.	Longline	1 May to 30 April	Longlines are not compatible as insufficient space and impracticable.

SESSF Scalefish and Hook sector (SHS)	The SHS extends around south-eastern Australia to the border of South Australia and Western Australia (ABARES, 2023). The Management area off the coast of NSW is in areas greater than 200m depth	Target a variety of fish and shark species. The main species landed in the 2022-23 fishing season included Pink ling, Blue-eye trevalla and Ribaldo.	The SHS uses a variety of longline and dropline hook fishing methods, some of which are automated. The primary difference between manual longline and automatic longline is that the hooks are baited by a machine rather than by hand when using automatic longline (ABARES, 2023).		Pelagic long lines are not compatible. Due to insufficient space it is impracticable. However, droplines are compatible.
Eastern Tuna and Billfish Fishery (ETBF)	Operates in the Exclusive Economic Zone and adjacent high seas, from Cape York to the Victoria – South Australia border, including waters around Tasmania and the high seas of the Pacific Ocean	Key species include Striped marlin, Swordfish, Albacore, Bigeye tuna, and Yellowfin tuna. Some ETBF longliners catch southern bluefin tuna (<i>Thunnus maccoyii</i>) off New South Wales during winter, after fishing for tropical tunas and billfish earlier in the year, while others take them incidentally when targeting other tunas (ABARES, 2020).	Most of the catch in the fishery is taken with pelagic longlines, although a small quantity is taken using minor-line methods (ABARES, 2020).	1 January to 31 December	Pelagic longlines are not compatible due to insufficient space and will be impracticable. However minor line are potentially compatible.
Southern Bluefin Tuna Fishery	The Southern Bluefin Tuna Fishery (SBTF) spans the Australian Fishing Zone (ABARES, 2020).	Southern bluefin tuna (<i>Thunnus maccoyii</i>).	Since 1992, most of the Australian catch has been taken by purse seine, in the Great Australian Bight. Along the east coast Australian domestic longliners operate. Throughout the rest of its range, southern Bluefin tuna is targets by pelagic longliners from other fishing nations (ABARES, 2020).	1 December to 30 November	Longlining is not compatible with offshore windfarms as there will be insufficient space making it impracticable.
Small Pelagic Fishery (SPF)	The Small Pelagic Fishery (SPF) extends from southern Queensland to southern Western Australia, from the coast out to the Limit of the Australian Fishing Zone. (ABARES, 2020).	The key target species for the purse-seine vessels are Australian sardine (<i>Sardinops sagax</i>), blue mackerel (<i>Scomber australasicus</i>) and Jack mackerel (<i>Trachurus declivis</i>). The key target species for the midwater trawl fishery are Blue mackerel, Jack mackerel and Redbait (<i>Emmelichthys nitidus</i>) (ABARES, 2020)	The fishery includes purse-seine and midwater trawl fishing vessels (ABARES, 2020).	1 May to 30 April	Large scale seine netting is not compatible. Midwater trawl vessels are potentially compatible, however it is uncertain therefore there is still some risk, depending on the size of nets and trawls.

Southern Squid Jig Fishery (SSJF)	The Southern Squid Jig Fishery (SSJF) is located off New South Wales, Victoria, Tasmania and South Australia, and in a small area off southern Queensland (ABARES, 2020)	Single-species fishery, targeting Gould's squid (<i>Nototodarus gouldi</i>).	The SSJF uses the single jigging method. Up to 10 automatic jig machines are used on each vessel; each machine has 2 spools of heavy line, with 20–25 jigs attached to each line. High-powered lamps are used to attract squid (ABARES, 2020).	1 January to 31 December	Jigging is compatible
Bass Strait Central Zone Scallop Fishery (BSCZF)	The BSCZSF operates in the central area of Bass Strait between the Victorian and Tasmanian scallop fisheries (ABARES, 2023). In 2022, fishing was permitted throughout the management area, except in 4 scallop beds that were closed to fishing under the harvest strategy (ABARES, 2023)	The fishery is a single-species fishery targeting dense aggregations ('beds') of commercial scallop (<i>Pecten fumatus</i>) (ABARES, 2020)	Scallop Dredges	12 July to 31 December	Scallop dredges are not compatible as a result of HSE issues and causing damage to cables.
Victorian Fisheries Authority managed Fisheries					
Rock Lobster Fishery	The Eastern zone boundaries are between 143°40' East longitude and 150°20' east longitude at latitude 39°12' south. The Western zone boundaries are between 143°40' east longitude and 140°57.9' east longitude at latitude 40° south (VFA website).	Southern rock lobster (<i>Jasus edwardsii</i>)	Baited commercial pots	1 July to 30 June the following year	Pots are compatible.
Giant Crab Fishery (GCF)	The boundaries of the GCF are between 143°40' east longitude and 143°40' east longitude at 40° south latitude. Boundaries mimic those of the Rock Lobster fishery, however the fishery is based in the Western Zone (VFA website)	Giant Crab (<i>Pseudocarcinus gigas</i>)	Baited commercial pots	1 July to 30 June the following year.	Pots are compatible.
Ocean Fish General	Along the entire Victorian coastline and out to 20 nautical miles offshore, except marine reserves.	Multi-species (not confirmed)	Multi-gear (not confirmed)	Year Round	Compatibility of different gear types needs to be confirmed.
Octopus Fishery	Three zones have been established for the management of commercial octopus fishing in Victoria.	Mainly pale octopus (<i>Octopus pallidus</i>). Maori octopus (<i>Macroctopus maorum</i>) and Gloomy Octopus (<i>Octopus tetricus</i>) may also be taken.	Lines of Octopus pots. The Eastern zone use purpose-built unbaited traps which minimise bycatch.	N/A	Pots are compatible.

Inshore Trawl Fishery	The eastern part of Victoria is well-known for its trawling fishery. Many fishers operate from lakes entrance and target the waters out from this port.	Multi species fishery, targeting both demersal and non-pelagic finfish	Trawling is an active fishing method.	N/A	Trawling is not compatible with windfarm sites
Victorian Wrasse (Ocean) Fishery	Along the entire Victorian coastline and out to 20 nautical miles offshore, except marine reserves.	Majority blue throat Wrasse (<i>Notolabrus tetricus</i>) and Purple Wrasse (<i>N. fucicola</i>).	Hook and line	Year Round	Hook and line is compatible
Abalone Fishery	Operates in state and adjacent Commonwealth waters in Bass Strait (Commonwealth of Australia 2016).	<i>Blacklip Abalone (Haliotis rubra)</i> and <i>Greenlip Abalone (H. laevigata)</i> .	Hand collection using surface air supply (hookah system) or SCUBA from small fishing boats (Commonwealth of Australia, 2016).	1 April to 31 March the following year.	Hand collection is compatible.
Scallop (Ocean) Fishery	The waters of the Victorian zone extend out to 20 nautical miles from the high tide water mark, but exclude the bays and inlets along the coast where commercial fishing for scallops is prohibited.	Scallop (<i>Pecten fumatus</i>). Occasionally, incidental catches of doughboy scallops (<i>Chlamys asperrimus</i>) are taken as by-product, but are generally not in commercial quantities.	Commercial fishing for scallops is by dredging; vessels tow a single dredge that is dragged along the seabed. Dredges are deployed from the rear of the vessel and are up to 4.5 metres wide. A tooth-bar on the bottom of the mouth of the dredge lifts scallops from the seafloor and into the dredge baskets	1 April to 31 March the following year.	Dredging is not compatible as will cause HSE issues and damage to cables.
Pipi Fishery	Covers the entire Victorian coastline, with the exception of Port Phillip Bay and Marine National Parks. The two main harvesting areas are Discovery Bay in the south-west (mainly commercial) and Venus Bay in the east (mainly recreational)	Pipi (<i>Donax deltooides</i>).	Hand collection	N/A	Hand collection is compatible
Bays and Inlet Fisheries/ corner Inlet Fishery	The larger bay and inlet fisheries include Western Port, Port Phillip Bay, Corner Inlet/Nooramunga, and the Gippsland Lakes. Commercial fishing (other than bait and eels) has been removed from the smaller inlets and estuaries that include Anderson Inlet, Mallacoota Inlet, Lake Tyers, among other minor inlets across the state.	Multi Species fisheries.	Multi-method fisheries. Fishing equipment includes; Octopus trap, bay fish trap, fishing line (including a longline), underwater breathing apparatus and a hand operated bait pump, seine net and dip net.	N/A	Some methods are compatible such as traps, and hand collection. However other methods are not compatible such as longline and seine netting depending on the size of nets.

Eel Fishery	Eel are harvested in Victorian coastal river basins south of the Great Dividing Range. Short finned eels are found across the State, while long-finned eels are only found in eastern Victoria.	The target species in Victoria's Eel Fishery are the short-finned eel (<i>Anguilla australis</i>) and long-finned eel (<i>A. reinhardtii</i>).	Commercial fishers are only permitted to use fyke nets	N/A	Fyke nets are compatible
--------------------	---	--	--	-----	--------------------------



APPENDIX C

LIKELIHOOD OF OCCURRENCE: LISTED THREATENED ECOLOGICAL COMMUNITIES AND LISTED THREATENED / MIGRATORY SPECIES

Likelihood of Occurrence

Key:	Recorded in Study Area (ALA records, known to occur or likely to occur distribution)	Recorded in Study Area (ALA records or may occur distribution)	Not recorded within Study Area (no ALA records and no distribution)
Suitable habitat known to occur within OWF Site / Offshore Cable Envelope, or habitat common and widespread.	High	Moderate	Moderate
Suitable habitat within OWF Site / Offshore Cable Envelope and habitat moderately common.	Moderate	Low	Low
Restricted or no suitable habitat within OWF Site / Offshore Cable Envelope	Low	Unlikely	Unlikely
Not marine - No habitat / Hestage / presence expected in the OWF Site / Offshore Cable Envelope	No	No	No

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Threatened Ecological Communities												
Subtropical and Temperate Coastal Saltmarsh	N/A	Vulnerable	N/A	N/A	The Subtropical and Temperate Coastal Saltmarsh ecological community occurs within a relatively narrow margin of the Australian coastline, south of the central Mackay coast on the east coast of Queensland, southerly around Australia to including Shark Bay on the west coast of Western Australia (26° latitude), and including the Tasmanian coast and islands within this range. The ecological community occurs on the coastal margin, along estuaries and coastal embayments and on low wave energy coasts. It is typically found on sandy or muddy substrate and may include coastal clay pans or similar areas. It occurs in places with at least some tidal connection, including rarely-inundated supratidal areas, intermittently opened or closed lagoons, and groundwater tidal influences. The ecological community may also include areas that have groundwater connectivity to tidal water bodies. The ecological community consists of dense to patchy areas of mainly salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges and shrubs that may also include bare sediment as part of the mosaic).	Y	Y	Y	PMST: 'Likely to occur' in 10 km search buffer on terrestrial margin of Nearshore Cable Envelope. However, community does not occur within the OWF Site or Nearshore Cable Envelope. Marine Ecological Assessment: TEC distribution includes coastal areas adjacent to the Nearshore Cable Envelope, but is unlikely to occur within the Nearshore or Offshore Cable Envelopes. Review of coastal saltmarsh distribution data (Seamap Australia - National Marine Benthic Habitat Map) and aerial photography suggest that the TEC is separated from the Nearshore Cable Envelope by sandy beach and the barrier dune system (approximately 30 m to 300 m separation depending on location) and waterways/channels that allow tidal exchange with saltmarsh habitat are located approximately 15 km from the Nearshore Cable Envelope at the closest point (McCloughlin's Entrance, Corner Inlet). <i>Therefore, the TEC does not occur in the cable envelopes. However, it is noted that the ecology of the TEC is dependent on regular or intermittent tidal influence and may need to be addressed in terms of potential indirect impacts arising from marine components of the Project.</i>	No	No	No
Natural Damp Grassland of the Victorian Coastal Plains	N/A	Critically Endangered	N/A	N/A	The Natural Damp Grassland of the Victorian Coastal Plains is a type of grassland dominated by tussock grasses, typically with a sparse presence of trees and shrubs. It is generally found at elevations less than 100 metres above sea level, on heavy grey silty-loamy soils that are poorly draining, often damp and sometimes waterlogged. The ecological community is limited to southern Victoria, and has a disjunct distribution on the coastal plains. There are known occurrences in south Gippsland, the head of Western Port Bay, Phillip Island, Mornington Peninsula and the Bellarine Peninsula. The grassland generally is dominated by tussock grasses, notably Themeda triandra (kangaroo grass) on drier sites, or Poa labillardierei (tussock grass) on wetter sites. The range of grasses and forbs present includes species associated with damp sites.	Y	Y	Y	PMST: 'May occur' in 10 km search buffer on terrestrial margin of Nearshore Cable Envelope. However, community does not occur within the OWF Site or cable envelopes. Marine Ecological Assessment: Key diagnostic characteristics for the ecological community are terrestrial vegetation characteristics. The TEC is not expected to occur within the OWF Site or cable envelopes and is not dependent on marine influences. Not marine.	No	No	No
Listed threatened/migratory fauna - Seabirds												
Flesh-footed Shearwater, Flesh-footed Shearwater	<i>Ardenna carneipes</i>	N/A	Migratory	N/A	Locally common visitor to waters off southern Australia, mainly occurs in the subtropics over continental shelves and slopes and occasionally inshore waters. Individuals also pass over deeper waters when on migration. Diurnal loafing and probably some nocturnal roosting occur at sea	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes. Marine Ecological Assessment: The Flesh-footed Shearwater forages almost entirely at sea. Some birds from colonies on Lord Howe Island range west across the Tasman Sea to waters extending to south-eastern Tasmania, while those from Western Australia range to waters off south-western Victoria and western Tasmania. The OWF Site and cable envelopes lie between these two areas, with birds from either regional colony possibly foraging in the project envelope.	Moderate	Moderate	Moderate
Sooty Shearwater	<i>Ardenna grisea</i>	Vulnerable	Migratory	N/A	The Sooty Shearwater is a large, robust sea bird. In Australia, the Sooty Shearwater breeds on islands off New South Wales (NSW) and Tasmania. The species occurs off the coast of south-east Queensland in small numbers and is a moderately common migrant and visitor to Victoria and South Australia.	Y	Y	Y	PMST: Species or species habitat may occur within OWF Site search area and cable envelopes. Marine ecological Assessment: This species has been previously recorded in the Nearshore Cable Envelope buffer and is a moderately common migrant and visitor to Victoria. It forages in pelagic (open ocean) waters and may forage inshore occasionally, especially during rough weather.	Moderate	Moderate	Moderate

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Antipodean Albatross	<i>Diomedea antipodensis</i>	Vulnerable	Migratory	N/A	At sea, Antipodean albatrosses range across the South Pacific from Australia to as far as Chile, from the Tropic of Capricorn south. They breed on the Auckland Islands, Antipodes Islands, and Campbell Island. Birds from the Auckland Islands use differing foraging strategies according to sex, with females tending to frequent the Tasman Sea in the vicinity of 40°S, while males either disperse westwards at lower latitudes or travel north-east towards the mid-Pacific Ocean. Non-breeding male and female birds forage westwards to the south-eastern Indian Ocean, including southern and sub-Antarctic Australia.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes Marine Ecological Assessment: The Antipodean Albatross breeds on the New Zealand islands of Antipodes Island, Campbell Island, Pitt Island and the Auckland Islands. Data from satellite tracking indicate that birds from the Auckland Islands forage mostly west of New Zealand over the Tasman Sea and south of Australia, while those from Antipodes Island forage east of New Zealand in the South Pacific, as far as the coast of Chile, and have a larger overall range. The current extent of occurrence of Antipodean Albatrosses is estimated to be 37 400 000 km², while the estimated area of occupancy of breeding birds is 670 km². Non-breeding birds from the Auckland Islands forage westwards to the south-eastern Indian Ocean, including southern and sub-Antarctic Australia. No records in the OWF Site or cable envelopes, some records off the coast of NSW and eastern Victoria. They are more likely to forage at the outer edge of shelves and deep waters but have large foraging areas that may include the OWF Site and cable envelopes.	Moderate	Moderate	Low
Gibson's Albatross	<i>Diomedea antipodensis gibsoni</i>	Vulnerable	N/A	N/A	A large Albatross species, with breeding confined to New Zealand. Gibson's Albatross has been recorded foraging between Coffs Harbour, NSW, and Wilson's Promontory, Victoria. Males and females appear to use different foraging areas, with females frequenting the Tasman Sea in the vicinity of 40°S, while males either disperse westwards at lower latitudes or north-east towards the mid-Pacific Ocean.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes Marine ecological Assessment: Gibson's Albatross breeds on Adams Island and Auckland Island, New Zealand. The principal feeding area of females is in the Tasman Sea, and principal feeding area of males is further south or the mid-Pacific Ocean. There are no breeding colonies of Gibson's Albatross in Australian territory. This albatross visits Australian waters while foraging and during the non-breeding season. Non-breeding birds are usually found between the latitudes of 30° and 50° S, where weather systems assist foraging. Gibson's Albatross feeds pelagically, using the wind to travel great distances to forage. Few records of this species in Australia and none in the OWF Site or cable envelopes. However, it has been recorded foraging between Coffs Harbour, NSW, and Wilson's Promontory, Victoria.	Moderate	Moderate	Moderate
Southern Royal Albatross	<i>Diomedea epomophora</i>	Vulnerable	Migratory	Critically Endangered	The southern royal albatross is a large seabird from the albatross family. At an average wingspan of above 3 m, it is one of the two largest species of albatross. The species breeds in New Zealand then circumnavigates the Southern Ocean, but is most commonly recorded in New Zealand and South American waters.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes Marine ecological Assessment: The foraging range of the Southern Royal Albatross includes Australian waters. Circumpolar dispersal from New Zealand during non-breeding periods includes southern Australian waters, with foraging likely to occur in the project envelope. Records of the species in the cable envelopes and waters surrounding the OWF Site.	High	High	High
Wandering Albatross	<i>Diomedea exulans</i>	Vulnerable	Migratory	Critically Endangered	The wandering albatross is a large seabird from the family Diomedidae, which has a circumpolar range in the Southern Ocean. Macquarie Island is one of 28 breeding sites.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes Marine Ecological Assessment: The Wandering Albatross has a circumpolar distribution in the Southern Ocean. In Australian territory, the Wandering Albatross breeds on Macquarie Island and a single breeding pair has also been recorded on Heard Island. Multiple records in the OWF Site and cable envelopes. Foraging (known to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers the whole South-east Marine Region.	High	High	High
Northern Royal Albatross	<i>Diomedea sanfordi</i>	Endangered	Migratory	N/A	The Northern Royal Albatross breeds in New Zealand waters. Away from its nesting sites this Albatross is circumpolar between 30 and 45 degrees south. Most of the population spends the non-breeding period off both coasts of southern South America. It visits southern Australian waters in the winter and early spring period.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes Marine ecological Assessment: The foraging range of the Northern Royal Albatross includes Australian waters. Circumpolar dispersal from New Zealand during non-breeding periods includes southern Australian waters, with foraging likely to occur in the project envelope. No records in the OWF Site or cable envelopes, but has been recorded in the Bass Strait.	Moderate	Moderate	Moderate
White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	<i>Fregetta grallaria grallaria</i>	Vulnerable	N/A	N/A	A small, compact storm-petrel that breeds on small offshore islets and rocks in the Lord Howe Island group. Its pelagic distribution is poorly understood, but it has been recorded north and east of its breeding islands to the tropics, in the Tasman Sea, Coral Sea, and north of New Zealand. It has also been recorded over near-shore waters off the coasts of NSW and Tasmania.	Y	Y	Y	PMST: Species or species habitat likely to occur within OWF Site search area and cable envelopes Marine ecological Assessment: The White-bellied Storm-Petrel (Tasman Sea) breeds on offshore islets and rocks in the Lord Howe Island group, Australia, and on Macauley Island and Curtis Island, in the Kermadec Islands group, New Zealand. Its pelagic distribution is poorly understood, but it has been recorded north and east of its breeding islands to the tropics, in the Tasman Sea, Coral Sea, and north of New Zealand, and it is thought that some birds reach the central Pacific Ocean. It has also been recorded over near-shore waters off the coasts of mainland Australia, Tasmania and New Zealand. In the non-breeding season, it reaches and forages over near-shore waters along the continental shelf of mainland Australia. Habitat likely to occur in the OWF Site and cable envelopes. No ALA records available.	Moderate	Moderate	Moderate

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Blue Petrel	<i>Halobaena caerulea</i>	Vulnerable	N/A	N/A	The blue petrel is gregarious, occurring in small loose flocks of up to 100, with larger flocks close to breeding islands. It is circumpolar, ranging from pack ice to 30° S. It breeds on offshore stacks near Macquarie Island where 500-600 breeding pairs occur. It is also known to breed on a number of other islands in the southern Atlantic and Indian Oceans with a total population of 80 000. On mainland Australia, the species is mainly seen between July and September. The blue petrel forages in Antarctic and subantarctic waters. Adults are perhaps mainly sedentary, though young birds are more dispersive.	Y	Y	Y	PMST: Species or species habitat may occur within PMST search area Marine ecological Assessment: The species is circumpolar, ranging from pack ice to 30° S. It breeds on offshore stacks near Macquarie Island where 500-600 breeding pairs occur. It is also known to breed on a number of other islands in the southern Atlantic and Indian Oceans with a total population of 80 000. On mainland Australia, the species is mainly seen between July and September. No records in the OWF Site or cable envelopes but the species has been recorded in the Bass Strait and Tasman Sea. Habitat may occur in the OWF site and cable envelope.	Moderate	Moderate	Moderate
Southern Giant Petrel	<i>Macronectes giganteus</i>	Endangered	Migratory	Endangered	The Southern Giant Petrel is the largest petrel, and has been described as looking like a small, ungainly brown albatross with a massive greenish-tipped straw coloured bill, surmounted by a large single nostril-tube. Mature adults are grey-brown with a faded and mottled-white head, neck and breast. The underwing has a pale leading edge, near the body, which should aid in discrimination from the Northern Giant Petrel, in which this area is dark brown	Y	Y	Y	PMST: Species or species habitat may occur within PMST search areas Marine ecological Assessment: The Southern Giant-Petrel is widespread throughout the Southern Ocean. In Australia, it breeds on six subantarctic and Antarctic islands in Australian territory; Macquarie Island, Heard Island and McDonald Island in the Southern Ocean, and Gigantous Island, Hawker Island, and Frazier Island in the Australian Antarctic Territories. No records within the OWF or cable envelopes but occur in adjacent offshore waters. Suitable habitat for foraging likely to be present.	Moderate	Moderate	Moderate
Northern Giant Petrel	<i>Macronectes halli</i>	Vulnerable	Migratory	Endangered	Northern giant petrels are dark grey, whitish on the face and chin, and mottled white on the head, neck and breast. Their plumage becomes paler and more mottled as they age. Adults have a conspicuous pale grey iris, whereas juveniles have dark ones. Northern giant petrels are regular visitors to southern Australian and South African waters in winter and spring.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and cable envelopes Marine ecological Assessment: The Northern Giant-Petrel occupies the Antarctic Polar Front. In summer, it occurs predominantly in sub-Antarctic to Antarctic waters, usually between 40 and 64° south in open oceans. Its range extends into subtropical waters (to 28°S) in winter and early spring. Multiple records in cable envelopes and OWF site- and adjacent offshore waters. Habitat may occur in the OWF site and cable envelopes. Forages almost entirely at sea.	High	High	High
Fairy Prion (southern)	<i>Pachypsalis turtur subantarctica</i>	Vulnerable	N/A	N/A	The fairy prion (southern) (P. t. subantarctica) breeds on Macquarie Island and a number of other subantarctic islands outside of Australia. There are 80 to 250 breeding pairs in Australia and a global population of 80 000. In Australia, breeding is recorded on two rock stacks off Macquarie Island and on the nearby Bishop and Clerk Island. The population may have been larger prior to the arrival of black rats on Macquarie Island. Some individuals may migrate towards New Zealand and southern Australia in winter. The other subspecies (P. t. turtur) breeds on New Zealand offshore islands in Bass Strait and the Falkland Islands. That subspecies has a population of several million pairs.	Y	Y	Y	PMST: Species or species habitat known to occur within cable envelopes and may occur in OWF Site Marine ecological Assessment: In Australia, breeding is recorded on two rock stacks off Macquarie Island and on the nearby Bishop and Clerk Island. No records in OWF site or cable envelopes, but recorded further offshore and in waters surrounding Tasmania. Habitat known occur in the OWF site and cable envelopes. Species forages almost entirely at sea. N.B. The Likelihood of Occurrence assessment is based solely on the subspecies, P. t. subantarctica. The other subspecies (P. t. turtur) has breeding sites that include Bass Strait, including Seal Island, Notch Island, Rag Island and Clifty Island near the OWF. It is highly likely that this subspecies will be present in the OWF Site and Offshore Cable Envelope, however, this subspecies is not listed as Threatened or Migratory (it is listed as Marine) under the EPBC Act.	Moderate	Moderate	Moderate
Sooty Albatross	<i>Phoebastria fusca</i>	Vulnerable	Migratory	Critically Endangered	The sooty albatross breed on sub-Antarctic islands and range at sea across the Southern Ocean from South America to Australia. Inhabits sub-Antarctic and subtropical marine waters. Nests amongst vegetation on inland and seaward cliffs of oceanic islands	Y	Y	Y	PMST: Species or species habitat likely to occur within OWF area and may occur in cable envelopes Marine ecological Assessment: The Sooty Albatross breeds on islands in the southern Indian and Atlantic Oceans, and forages south of 30° S, between southern NSW and Argentina. The Sooty Albatross has sometimes been observed foraging in inshore waters in southern Australia. The Sooty Albatross is a rare, but probably regular migrant to Australia, mostly in the autumn-winter months, occurring north to south east Queensland, NSW, Victoria, Tasmania and South Australia. No records within the OWF or cable envelopes however occur in adjacent offshore waters. Suitable habitat for foraging likely to be present.	Moderate	Moderate	Moderate
Gould's Petrel, Australian Gould's Petrel	<i>Pterodroma leucoptera leucoptera</i>	Endangered	N/A	N/A	Has a body length of 30 cm and a wingspan of 75 cm. The upper surface of their long narrow wings has a distinctive 'M' pattern. This together with a darker head, distinguishes them from other petrels of similar size. The underside of the wings and body are white with a dark edge to the wing that terminates in a diagonal bar. Both sexes are identical and immature birds fledge in adult plumage.	Y	Y	Y	PMST: Species or species habitat may occur within PMST search areas Marine Ecological Assessment: The distribution at sea of the species as a whole is poorly known, but near Australia it is thought to extend from the waters off Tasmania into the Tasman Sea, where the species ranges to the west coast of New Zealand, south to near Codfish Island in the Foveaux Strait. The Australian subspecies of the Gould's Petrel breeds in NSW on Cabbage Tree Island and nearby Boondell Island, near Port Stephens, and at least one pair on Montague Island, near Narooma. No records within the OWF or cable envelopes and few records in the Bass Strait. Suitable habitat for foraging likely to be present. Breeding typically occurs in New South Wales for the Australian population.	Moderate	Moderate	Moderate

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Buller's Albatross, Pacific Albatross	<i>Thalassarche bulleri</i>	Vulnerable	Migratory	Endangered	Buller's albatross is a small bird in the albatross family. It breeds on islands around New Zealand, and feeds in the seas off Australia and the South Pacific.	Y	Y	Y	PMST: Species or species habitat may occur within PMST search area Marine Ecological Assessment: Buller's Albatross is a New Zealand resident, breeding on Snares and Solander Islands. During the breeding season, the highest concentrations of Buller's Albatross occur over the shelf and slope waters off southern New Zealand. Individuals generally remain near the breeding sites but, even when breeding, may cross the Tasman Sea. Non-breeding birds probably disperse to oceanic subtropical waters of the western South Pacific, or the Humboldt Current off the western South American coast. Buller's Albatross breed in New Zealand (Snares, Solander and Chatham Islands), but are regular visitors to Australian waters. They are frequently seen off the coast from Coffs Harbour, south to Tasmania and west to Eyre Peninsula, however, some of these records may be the Pacific Albatross. One record in the OWF site. Foraging (known to occur) BIA occurs in the OWF Site and Offshore Cable Envelope. BIA covers most of the South-east Marine Region.	Moderate	Moderate	Moderate
Northern Buller's Albatross, Pacific	<i>Thalassarche bulleri platei</i>	Vulnerable	N/A	Endangered	<i>Thalassarche bulleri platei</i> : breeds Chatham Islands, also (very small numbers) Three Kings Islands, off the North Island of New Zealand; ranges at sea across the southern South Pacific (southern Australia to South America)	Y	Y	Y	PMST: Species or species habitat may occur within PMST search areas Marine Ecological Assessment: The species breeds only on Chatham and Three Kings Island, New Zealand, and during this period it is also recorded in the oceanic subtropical east of New Zealand (EA 2001f). Most birds seem to disperse outside Australasian seas during the non-breeding season. Away from the breeding grounds, they tend to range across the south Pacific Ocean north of the Antarctic Convergence, from south-east Australia to west South America. Some non-breeding birds have been sighted off the west coast of South America and it is possible that many also forage over the Louisville Ridge north-east of New Zealand. A non-breeding visitor to Australian waters. Foraging birds are mostly limited to the Pacific Ocean and the Tasman Sea, although birds do reach the east coast of the Australian mainland. The foraging distribution of this species is poorly known, predominantly due to taxonomic confusion and the difficulty of distinguishing it from Buller's Albatross at sea. No ALA records available. Suitable habitat for foraging may be present.	Low	Low	Low
Indian Yellow-nosed Albatross	<i>Thalassarche carteri</i>	Vulnerable	Migratory	Endangered	Significant taxonomic confusion exists within the albatross group. The Yellow-nosed Albatross <i>Diomedea chlororhynchos</i> was previously thought contain two subspecies. One in the Indian Ocean (the Indian Yellow-nosed Albatross) and another in the Atlantic (the Atlantic Yellow-nosed Albatross). Recently however, the Agreement on the Conservation of Albatrosses and Petrels (ACAP), of which Australia is a signatory, has established a working group on the taxonomy of albatrosses and petrels. This working group has agreed to resurrect the historic generic name <i>Thalassarche</i> for medium-sized albatrosses, and splitting the <i>D. chlororhynchos</i> complex into two species. Under this revised taxonomy, the Indian Yellow-nosed Albatross is raised to full species status as <i>Thalassarche carteri</i> . his taxonomy is not accepted by all authorities	Y	Y	Y	PMST: Species or species habitat likely occur within PMST search areas Marine Ecological Assessment: The Indian Yellow-nosed Albatross occurs in the southern Indian Ocean. The species breeds on islands in the sub-Antarctic Indian Ocean, including Prince Edward Islands (South Africa), Kerguelen Islands, Crozet Island, Amsterdam and St Paul Islands (France). Forages mostly in the southern Indian Ocean where it is particularly abundant off Western Australia. Foraging (known to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers most of the South-east Marine Region. Species recorded within and adjacent the OWF Site and cable envelopes.	High	High	High
Shy Albatross	<i>Thalassarche cauta</i>	Endangered	Migratory	Endangered	The shy albatross is a medium-sized albatross that breeds on three remote islands off the coast of Tasmania, Australia, in the southern Indian Ocean.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within PMST search areas Marine Ecological Assessment: The shy albatross breeds on three remote islands off the coast of Tasmania in the southern Indian Ocean. Multiple records in cable envelopes and OWF site and adjacent offshore waters. Foraging (likely to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers the whole South-east Marine Region.	High	High	High
Grey-headed Albatross	<i>Thalassarche chrysostoma</i>	Endangered	Migratory	Endangered	The grey-headed albatross also known as the grey-headed mollymawk, is a large seabird from the albatross family. It has a circumpolar distribution, nesting on isolated islands in the Southern Ocean and feeding at high latitudes, further south than any of the other mollymawks. Primary breeding location in Australia is Macquarie Island, Tasmania.	Y	Y	Y	PMST: Species or species habitat may occur within PMST search areas Marine Ecological Assessment: The Grey-headed Albatross has a circum-global distribution in the Southern Hemisphere. Habitat may occur in the OWF Site and cable envelopes. No records in the OWF or cable envelopes, however, some records in adjacent waters of the Bass Strait. Most Australian records come from south and west of Tasmania, occasionally in Victorian waters, rarely in South Australia and Western Australia, and only as a vagrant in NSW.	Moderate	Moderate	Moderate

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (COWTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Campbell Albatross, Campbell Blackbrowed Albatross	<i>Thalassarche impavidia</i>	Vulnerable	Migratory	N/A	The Campbell Albatross is a medium sized albatross, with a wingspan of 210–250 cm. Like the Black-browed Albatross (<i>Thalassarche melanophris</i>), adult Campbell Albatross have a white head with a distinctive black brow, bright yellow-orange bill and broad black leading edge on the underwing.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within area Marine Ecological Assessment: Campbell Albatrosses occur in Antarctic and sub-Antarctic waters, and in the subtropical South Pacific Ocean. They breed only on sub-Antarctic Campbell Island (New Zealand), south of New Zealand. Throughout the breeding season, breeding adults are generally found over the shelf waters surrounding New Zealand, whereas non-breeding birds often forage over the continental slopes around Australia. Non-breeding birds are most commonly seen foraging over the oceanic continental slopes off Tasmania, Victoria and New South Wales. After breeding, birds move north and may enter Australia's temperate shelf waters. No records in the OWF Site or cable envelopes; records primarily over continental slope, although some in the shelf waters of the central Bass Strait. Foraging (known to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers the whole South-east Marine Region.	Moderate	Moderate	Moderate
Black-browed Albatross	<i>Thalassarche melanophris</i>	Vulnerable	Migratory	N/A	The black-browed albatross is a large seabird of the albatross family Diomedidae; it is the most widespread and common member of its family.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within area Marine Ecological Assessment: The black-browed albatross is circumpolar in the Southern Ocean. The Black-browed Albatross breeds within Australian jurisdiction on the sub-Antarctic islands of Heard Island, McDonald Islands, Macquarie Island, Bishop and Clerk Islets. During the breeding season, the species is an uncommon visitor to the continental shelf-break of southern Australia. The population migrates northward and is common in the non-breeding period at the continental shelf and shelf-break of South Australia, Victoria, Tasmania, western and eastern Bass Strait and NSW. Foraging (known to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers the whole South-east Marine Region.	High	High	High
Salvin's Albatross	<i>Thalassarche salvini</i>	Vulnerable	Migratory	N/A	Salvin's Albatross is a large albatross, with a wingspan of 212–256 cm. They are sexually dimorphic, with the males being larger than females. As a member of the black-backed group, dark mottling over the back of Salvin's Albatross contrasts with its white rump.	Y	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within PMST search areas. Marine Ecological Assessment: Breeding identified on sub-Antarctic islands, including Chatham Island and Bounty Island south of NZ. Salvin's Albatross is a non-breeding visitor to Australian waters. During the non-breeding season, the species occurs over continental shelves around continents. It occurs both inshore and offshore. No records within the OWF or cable envelopes but occur in adjacent offshore waters. Suitable habitat for foraging likely to be present.	Moderate	Moderate	Moderate
White-capped Albatross	<i>Thalassarche steadi</i>	Vulnerable	Migratory	N/A	The white-capped albatross is a mollymawk that breeds on the islands off of New Zealand. Not all experts agree that this form should be recognized as a separate species from the shy albatross, <i>Thalassarche cauta</i> . It is a medium-sized black, slate gray, and white albatross and is the largest of the mollymawks	Y	Y	Y	PMST: Foraging, feeding or related behaviour known to occur within area Marine Ecological Assessment: The White-capped Albatross is probably common off the coast of south-east Australia throughout the year. No records within the OWF or OCE however occur in adjacent offshore waters. Suitable habitat for foraging likely to be present.	Moderate	Moderate	Moderate
Short-tailed Shearwater	<i>Ardenna tenuirostris</i>	N/A	Migratory	N/A	The short-tailed shearwater is the most abundant seabird in Australian waters. It is migratory, breeding on small islands in the Bass Strait and Tasmania.	Y (identified through VBA, not PMST)	Y (identified through desktop review, not PMST)	Y (identified through desktop review, not PMST)	PMST: N/A - Species was not identified in the PMST search, however, the species has been identified in the VBA for the OWF Site and included on the basis that a foraging BIA has been defined that overlaps with the OWF Site and cable envelopes. Marine Ecological Assessment: Multiple records in cable envelopes and OWF sites and adjacent offshore waters. Foraging (known to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers waters surrounding Tasmania including Bass Strait. Seal Island, Notch Island, Rag Island and Clifty Island near the OWF are known rookeries.	High	High	High
White-faced Storm-petrel	<i>Pelagodroma marina</i>	N/A	N/A	Endangered	The white-faced storm petrel is a small migratory seabird. It breeds on remote islands in the south Atlantic, Australia and New Zealand. Common and widespread in subtropical and tropical waters across the globe.	Y (identified through VBA, not PMST)	Y (identified through desktop review, not PMST)	Y (identified through desktop review, not PMST)	PMST: N/A - Species was not identified in the PMST search, however, the species has been identified in the VBA for the OWF Site and included on the basis that a foraging BIA has been defined that overlaps with the OWF Site and cable envelopes. Marine Ecological Assessment: Multiple records in cable envelopes and OWF sites and adjacent offshore waters. Foraging (known to occur) BIA occurs in the OWF Site and cable envelopes. BIA covers waters surrounding East Gippsland, Port Phillip Bay, Bass Strait, and buffer around northern and eastern Tasmania.	High	Moderate	Moderate
Australian Fairy Tern	<i>Sterna nereis nereis</i>	Vulnerable	N/A	Critically Endangered (Sterna nereis)	the Fairy Tern is bulky and roundbodied, approximately 22–27 cm in length, 70 g in weight and has a wingspan of 44–53 cm. Within Australia, the Fairy Tern occurs along the coasts of Victoria, Tasmania, South Australia and Western Australia; occurring as far north as the Dampier Archipelago near Karratha. The subspecies has been known from New South Wales (NSW) in the past, but it is unknown if it persists there. The Australian Fairy Tern nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. It has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline.	Y	Y	Y	PMST: Species or species habitat known to occur. Marine Ecological assessment: The Australian Fairy Tern occurs along the coasts of New South Wales, Victoria, Tasmania, South Australia and Western Australia. Fairy Terns utilise a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands, beaches and spits. Species is known to occur in the area, particularly in nearby Corner Inlet, but there is estimated to be only a few pairs in Victoria. Habitat for this species is likely to occur at the shoreline of the Nearshore Cable Envelope. They may forage in the shallower waters of the cable envelopes and OWF.	Low	Moderate	Moderate

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (COWH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Little Tern	<i>Sterna albiglans</i>	N/A	Migratory	Critically Endangered	The Little Tern is a small, slender and elegant marine tern. Non-breeding birds extend farther around the Australian coast than known breeding colonies, as well as overlapping extensively with the Australian breeding range. In south-eastern Australia, the species is generally rare west of Corner Inlet in Victoria, straggling as far west as south-eastern South Australia. Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches.	N	Y	Y	PMST: Species or species habitat may occur in the cable envelope search areas Marine Ecological Assessment: Species is widely distributed across Australia and has been reported to breed in Victoria. The Australian breeding population is divided into a northern subpopulation and an eastern subpopulation that breeds on the eastern and south-eastern coast of the mainland and northern and eastern Tasmania, occasionally extending as far west as western Victoria and south-eastern South Australia. A third population of Asian migrants spends the non-breeding season in Australia but mainly in the north and east. Species and species habitat may occur in the area on shorelines. Multiple records on shoreline and in coastal waters in and adjacent to the NCE. Species is associated with coastal areas and wetlands. Foraging occurs in shallow waters of channels, estuaries and beaches. May occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Low	High	High
Crested Tern	<i>Thalasseus bergii</i>	N/A	Migratory	N/A	The Crested Tern (<i>Thalasseus bergii</i>), also called Greater Crested Tern or Swift Tern, is a tern in the family Laridae that nests in dense colonies on coastlines and islands. It has grey upperparts, white underparts, a yellow bill, and a shaggy black crest that recedes in winter. Its young have a distinctive appearance, with strongly patterned grey, brown and white plumage, and rely on their parents for food for several months after they have fledged. Like all members of the genus <i>Thalasseus</i> , they feed by plunge diving for fish, usually in marine environments.	Y (identified through VBA, not PMST)	Y (identified through VBA, not PMST)	Y (identified through VBA, not PMST)	PMST: N/A - Species not identified in the PMST search, however, the species has been identified in VBA searches and included on the basis that rookeries for this species occur on Seal Island, Notch Island, Rag Island and Clifty Island (located in State waters between approximately 12 km and 14 km west of the OWF Site). Marine Ecological Assessment: Species is widely distributed and can be found on islands and coastlines of tropical and subtropical areas, ranging from the Atlantic Coast of South Africa, south around the Cape and continuing along the coast of Africa and Asia almost without break to south-east Asia and Australia. Outside the breeding season it can be found at sea throughout this range. Widely distributed across Australia. Breeding colonies occur at Seal Island, Notch Island, Rag Island and Clifty Island (located approximately 12 km - 14 km west of the OWF Site). Multiple records in and adjacent to the OCE. Many populations remain sedentary in their breeding areas or disperse locally, but others are more migratory. Habitat includes coastal bays, inlets, wetlands, lakes and large rivers.	High	High	High
Listed threatened/migratory fauna - Shore birds												
Red Knot, Knot	<i>Calidris canutus</i>	Vulnerable	Migratory	Endangered	The Red Knot is a medium-sized, dumpy grey wader with a short neck and long body. The Red Knot is common in all the main suitable habitats around the coast of Australia. In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps	Y	Y	Y	PMST: Species or species habitat known to occur within cable envelopes and may occur within OWF search area Marine Ecological assessment: The Red Knot has a worldwide distribution, breeding at a range of locations right around the Arctic. The species then migrates to non-breeding areas that extend to the southernmost parts of the Americas, Africa, Europe and Australasia. The species has been previously recorded within coastal waters of the Nearshore Cable Envelope. Habitat known to occur within the cable envelopes. Forages in intertidal and wetland coastal habitats. Widely distributed across Australia. This migratory species is a regular visitor to the coasts of Victoria, Tasmania, and King and Flinders Islands, in small numbers. Therefore, individuals may migrate through the OWF Site.	Moderate	High	High
Curlew Sandpiper	<i>Calidris ferruginea</i>	Critically Endangered	Migratory	Critically Endangered	Small, slim sandpiper widespread across Australian coastal environments. Mostly occur in eastern Tasmania as well as several sites in Northwest Tasmania. In Victoria, they are widespread and common in coastal bays and inlets and near-coastal wetlands, and inland in suitable habitat. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters.	Y	Y	Y	PMST: Species or species habitat may occur within OWF search area and known to occur within cable envelopes Marine Ecological assessment: The species has been previously recorded offshore within the NCE. Habitat known to occur in the NCE shoreline. Forages in intertidal and wetland coastal habitats. Widespread across Australia and part of the EAAF. The species may migrate through the OWF Site as they migrate to and from Tasmania.	Moderate	High	High
Lesser Sand Plover, Mongolian Plover	<i>Charadrius mongolus</i>	Endangered	Migratory	Endangered	The Lesser Sand Plover is a small to medium-sized grey-brown and white shorebird. The lesser sand plover is widespread in coastal regions and has been recorded in all states. The breeding grounds are at high elevations (up to 5,500 m), above the tree-line, in tundra on steppes and in flat, barren valleys and basins, usually in boggy areas. In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometimes occurs in short saltmarsh or among mangroves. The species also inhabits saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological assessment: The species has been recorded within the cable envelopes. Habitat known to occur in the area. Widespread across Australia and part of the EAAF. However, the species is less common in southern Australia than in northern Australia. Forages on intertidal and coastal wetlands and shorelines.	Unlikely	High	High

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) Justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Greater Sand Plover, Large Sand Plover	<i>Charadrius leschenaultii</i>	Vulnerable	Migratory	Vulnerable	The Greater Sand Plover is a small-to-medium sized shorebird with a straight longish bill that bulges towards the end but has a pointed tip. The legs are long and olive-grey. In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. In Victoria, it is mostly recorded in Corner Inlet, Western Port and Port Phillip Bay which are outside of the Project Area.	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelope search areas Marine Ecological Assessment: The species has no records within the study area but has been recorded along the shoreline west of the cable envelope. Habitat known to occur through the cable envelopes. Forages in intertidal and wetland coastal habitats. Widespread across Australia and part of the EAAF. However, the species is less common in southern Australia than in northern Australia. In Victoria is mostly recorded from Corner Inlet, Western Port and Port Phillip Bay; small numbers occur in Tasmania in most years as well. The species may occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Low	Moderate	Moderate
Eastern Curlew, Far Eastern Curlew	<i>Numenius madagascariensis</i>	Critically Endangered	Migratory	Critically Endangered	Largest migratory shorebird in the world. Rarely recorded inland. A summer migrant to Australia, the eastern curlew inhabits estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	Y	Y	Y	PMST: Species or species habitat known to occur within OWF search area and cable envelope Marine Ecological assessment: The species has multiple records on the shoreline adjacent the NCE, and a large number of records associated with Corner Inlet wetland. In line with other migratory waders and shorebirds, this species habitat is moderately abundant, and is confined to the coastal areas. Forages in wetlands and intertidal coastal environments. Endemic to the EAAF. Widespread in Australia, primarily coastal. Found in all states, particularly the north, east, and south-east regions including Tasmania. In Victoria, the main strongholds are in Corner Inlet and Western Port Bay, with smaller populations in Port Phillip Bay and scattered elsewhere along the coast. Found on islands in Bass Strait and along the coasts of Tasmania. The species may occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Moderate	High	High
Australasian Shoveler	<i>Spatula rhynchotis</i>	N/A	N/A	Vulnerable	The Australasian Shoveler is a low-floating, dark headed duck, with a low sloping forehead blending to a heavy, square-cut, shovel-tipped bill. They inhabit a wide variety of wetlands, ranging from terrestrial swamps and lakes to estuaries and even sheltered inshore waters. They prefer wetlands with areas of open water fringed by abundant aquatic vegetation, where they feed in small groups by dabbling in the mud or at the water's surface to filter small aquatic invertebrates from the water.	N	Y (VBA search, not PMST)	Y (VBA search, not PMST)	PMST: Not identified in the PMST search. Species identified in the VBA search. Marine Ecological assessment: Native to Australia and New Zealand. Species is associated with freshwater wetlands, lakes and estuaries. Some records of species occurring in shallow waters of NCE and shoreline adjacent. Widely distributed across southwestern and eastern Australia including Tasmania.	No	No	Low
Musk Duck	<i>Biziura lobate</i>	N/A	N/A	Vulnerable	Musk Ducks get their name from the strong musk odour produced from a gland on the rump. The female is smaller than the male. Both male and female Musk Ducks are sooty-brown in plumage, with paler brown barring on the body and fine spots of the head. They are paler below, becoming whiter towards the abdomen. The male is decorated with a large bulbous lobe of skin hanging under his bill. This sac increases in size at the start of the breeding season. The female also has a much-reduced lobe on the underside of its bill, only visible at a short distance. The bill is dark grey in both sexes and the eye dark brown. The tail is a collection of long, stiff feathers, which can be held in a fan-shape. Young Musk Ducks are similar to the adult female, but are paler, with a dull yellow tip on bill, and no lobe.	N	Y (VBA search, not PMST)	Y (VBA search, not PMST)	PMST: Not identified in the PMST search. Species identified in the VBA search. Marine Ecological assessment: Endemic to Australia. Species is associated with freshwater wetlands, lakes and estuaries. Some records of species occurring in shorelines of NCE. Widely distributed across southwestern and southeastern Australia including Tasmania.	No	No	Low
Australian Painted Snipe	<i>Rostratula australis</i>	Endangered	N/A	Critically Endangered	The Australian Painted Snipe is a stocky wading bird around 220-250 mm in length with a long pinkish bill. The Australian Painted Snipe has been recorded at wetlands in all states of Australia and is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia. The species generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains	N	Y	Y	PMST: Species or species habitat likely to occur in cable envelopes. Marine Ecological assessment: The Australian Painted Snipe has been recorded at wetlands in all states of Australia and is most common in eastern Australia, including throughout much of Queensland, NSW, Victoria and south-eastern South Australia. Species is likely to occur in the area on shorelines during foraging or nesting. Two records 4-6 km south of NCE shoreline crossing. Species is associated with wetlands, swamps and estuaries.	No	No	Low
Eastern Hooded Plover	<i>Thinornis cucullatus cucullatus</i>	Vulnerable	N/A	Vulnerable	The hooded plover (eastern) is a small Australian beach nesting bird. It mainly occurs on wide beaches backed by dunes with large amounts of seaweed and jetsam, creek mouths and inlet entrances. Nests are found above the high water mark on flat beaches, on stony terraces, or on sparsely vegetated dunes.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological assessment: The Eastern hooded plover is widely dispersed on or near sandy beaches in south-eastern Australia from Jervis Bay (NSW) to Fowlers Bay (SA), and includes Tasmania and various offshore islands. It is widely distributed around Tasmania's coasts and offshore islands, which have an estimated minimum breeding population of 600 breeding pairs, or 1200 mature individuals. It occurs in low densities in Victoria, which has about 570 individuals. Species and species habitat is known to occur in the area on shorelines during foraging or nesting. One record in adjacent Corner Inlet. Species is associated with beaches, dunes, and inlets.	No	Low	Low

Not in report

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Nunivak Bar-tailed Godwit	<i>Limosa lapponica baueri</i>	Endangered	N/A	N/A	The Nunivak bar-tailed godwit is a large migratory shorebird. The bar-tailed godwit has been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria. It does not breed in Australia. The species prefers coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and sawworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats	N	Y	Y	PMST: Species or species habitat may occur in cable envelope search areas. Marine Ecological assessment: Nunivak Bar-tailed Godwit breeds in north-east Siberia and spends the non-breeding season in northern and eastern Australia and NZ. It has been recorded in the coastal areas of all Australian states and is widespread along the east and south-east coasts of Queensland, NSW and Victoria. In Tasmania, the bar-tailed godwit has mostly been recorded on the south-east coast. Despite large migration distances, bar-tailed godwit adults are thought to have high site fidelity in the non-breeding season. Species or species habitat is known to occur in the area on shorelines during foraging. Species is associated with sandflats, mudflats, estuaries and other coastal wetlands. The species may occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Low	Low	Low
Marsh Sandpiper	<i>Tringa stagnatilis</i>	N/A	Migratory	Endangered	The Marsh Sandpiper is a medium sized member of the Tringinae family. In all plumages the species shows a contrasting outwearing, a very pale whitish tail and a bold white wedge up the back. They occur singly or in small to large flocks, often associate with other waders and are often seen with Greenshanks, especially in saltfields. The Marsh Sandpiper is found on coastal and inland wetlands throughout Australia. In Victoria, most are found in Port Phillip Bay, but also Gippsland, Westernport Bay and the Western Districts. The species usually forages in shallow water at the edge of wetlands. They probe wet mud of mudflats or feed among marshy vegetation.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological Assessment: The Marsh Sandpiper breeds in east Europe, southern Siberia and northern China and migrates south for the boreal winter to non-breeding areas from Africa, across southern Asia to Australia. Found on coastal and inland wetlands throughout Australia. In Victoria, most are found in Port Phillip Bay, but also Gippsland, Westernport Bay and the Western Districts. The species is a vagrant to Tasmania. Species and species habitat known to occur in the area. Multiple records of occurrence along shoreline from Corner Inlet to Gippsland Lakes, and offshore in NCE shallow waters. Species is associated with wetlands, marshes and mudlands.	No	Low	Moderate
Common Greenshank	<i>Tringa nebularia</i>	Endangered	Migratory	Endangered	The Common Greenshank is a heavily built, elegant wader. The bill is long and slightly upturned and the legs are long and yellowish-green. The species is seen singly or in small to large flocks (sometimes hundreds) in a variety of coastal and inland wetlands. The Common Greenshank does not breed in Australia, however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia. Widespread in coastal regions, mainly between Gippsland Lakes and Port Phillip Bay.	N	Y	Y	PMST: Species or species habitat known to occur in the cable envelopes. Marine Ecological Assessment: The Common Greenshank breeds in the Palaearctic and flies south to non-breeding areas for the boreal winter. Part of the EAAF. Overwinters at only a few sites, found as far south as south-east Tasmania. In Victoria, is widespread in coastal regions, mainly between Gippsland Lakes and Port Phillip Bay and in the Murray River Valley. Species and species habitat is known to occur in the area. Multiple records of occurrence on shorelines and wetlands across Victoria and the NCE. Forages in wetlands, mudflats and shallow waters. The species may occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Unlikely	Low	High
Osprey	<i>Pandion haliaetus</i>	N/A	Migratory	N/A	The Osprey is a medium-sized raptor. Ospreys usually occur singly, occasionally in twos, or more rarely in family groups. The total range (breeding plus non-breeding) around the northern coast is more widespread, extending from Esperance in Western Australia to NSW and into Victoria and Tasmania, where the species is a rare vagrant.	N	Y	Y	PMST: Species or species habitat known to occur in the area. Recorded in VBA but not PMST searches. Marine Ecological Assessment: Adults are mostly resident or sedentary around breeding territories but they forage more widely. The breeding range extends around the northern coast of Australia, with a second isolated breeding population on the coast of South Australia. The species is a rare vagrant in Victoria and Tasmania. Species and species habitat is known to occur in the area. Multiple records in NCE and adjacent shoreline. Forages in shallow waters and coastal environments.	Unlikely	Unlikely	Moderate
Pacific Golden Plover	<i>Pluvialis fulva</i>	N/A	Migratory	Vulnerable	The Pacific Golden Plover is a medium-sized plover with long legs and an upright stance. The species usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as mangroves, low saltmarsh such as Sarcocornia, or beds of seagrass) in sheltered areas. The species is also sometimes recorded on islands, sand and coral cays and exposed reefs and rocks. In Australia, the species is widespread. Most Pacific Golden Plovers occur along the east coast. They are recorded at scattered sites in the south-east, with most records in Victoria along the coast between Jack Smith Lake (south of Sale) and the Bellarine Peninsula, including Western Port and Port Phillip Bay.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological Assessment: The Pacific Golden Plover breeds in the Northern Hemisphere and flies south for the boreal winter. Within Australia, the Pacific Golden Plover is widespread in coastal regions. Most occur along the east coast, and are especially widespread along the Queensland and NSW coastlines. Elsewhere, they are recorded at scattered sites in the south-east, with most records in Victoria along the coast between Jack Smith Lake and the Bellarine Peninsula, including Western Port and Port Phillip Bay. In Tasmania, records mainly occur along the eastern and northern coasts with a few scattered records elsewhere, including islands in Bass Strait. Species known to occur in the area on shorelines. Forages on beaches and tidal flats and is associated with wetlands and other coastal environment. Multiple records in NCE shoreline and in shallow offshore waters. May occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Low	Moderate	High
Fork-tailed Swift	<i>Apus pacificus</i>	N/A	Migratory	N/A	The Fork-tailed Swift is a medium-sized bird, with a slim body with long scythe-shaped wings that taper to finely pointed tips. The species is a non-breeding visitor to all states and territories of Australia. In Victoria it is widespread but sparsely scattered in all regions. they mostly occur over inland plains but sometimes above foothills or in coastal areas. They are almost exclusively aerial, often occurring over cliffs and beaches and also over islands and sometimes well out to sea.	Y	Y	Y	PMST: Species or species habitat likely to occur within area. Recorded in VBA but not PMST searches. Marine Ecological Assessment: The fork-tailed swift breeds in Siberia and is a non-breeding visitor to all states and territories of Australia. It is widespread but sparsely scattered in all regions of Victoria and also occurs on the islands of the Bass Strait. There are also some records on mainland Tasmania, mostly in the north. Species and species habitat known to occur in the area on shorelines. Species is predominantly aerial, associated with coastal areas. Multiple records adjacent to NCE, in Corner Inlet and along Wilson's Promontory. May occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Low	High	High

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Latham's Snipe	<i>Gallinago hardwickii</i>	Vulnerable	Migratory	N/A	Latham's Snipe is a medium sized wader, and the largest snipe in Australia. The species is usually occurs singly or in small, loose groups of less than a dozen birds. The species is widespread in Tasmania and is found in all regions of Victoria except for the north-west. Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies).	N	Y	Y	PMST: Species or species habitat likely to occur in the cable envelopes. Marine Ecological Assessment: Latham's Snipe is a non-breeding visitor to south-eastern Australia, migrating to areas along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia. The species is widespread in Tasmania and is found in all regions of Victoria except for the north-west. Species known to occur in the area, inhabiting a range of marine and terrestrial wetland environments. Multiple records occur along coastline and shallow waters in the NCE and adjacent area. The foraging habitats are areas of mud (either exposed or beneath a very shallow covering of water) and some form of cover (e.g. low, dense vegetation). May migrate through the OWF Site as they migrate to and from Tasmania.	Low	Moderate	High
Sanderling	<i>Calidris alba</i>	N/A	Migratory	N/A	The Sanderling is an active, pale wader. The Sanderling occurs in coastal areas around Australia (non breeding). Inland records have occurred in most states of singles or small groups, birds probably on migration. In Australia, the species is almost always found on the coast, mostly on open sandy beaches. They are regular around Corner Inlet, Shallow Inlet and Wilson's Promontory, and on the southwest coast.	N	Y (VBA search, not PMST)	Y (VBA search, not PMST)	PMST: Not identified in the PMST search. Species identified in the VBA search. Marine Ecological Assessment: This species has a circumpolar breeding distribution, migrating south to spend the non-breeding season predominantly on sandy coastal shores of all continents except Antarctica. Widespread in coastal areas around Australia. In Victoria, they are regular around Corner Inlet, Shallow Inlet and Wilson's Promontory, and on the southwest coast between Killarney and Nelson. In eastern Victoria they have been recorded at Mallacoota, Lakes Entrance and Kalbarra. Widespread records occur between Venus Bay and the southern Bellarine Peninsula. They are a regular, though scarce visitor to Tasmania. They occur on all coasts except the northern coast between Marrawah and Cape Naturaliste, and occur on King Island and the Furneaux Group of islands. Species known to occur in the area, with known activity at adjacent Corner Inlet and Sandy Inlet (maximum population ~709 individuals). Forages on wet beach sand, shallow pool edges and on mudflats. May occasionally migrate through the OWF Site as they migrate to and from Tasmania.	Unlikely	Moderate	Moderate
Bar-tailed Godwit	<i>Limosa lapponica</i>	Endangered	Migratory	Vulnerable	The Bar-tailed Godwit is a large wader, recorded in the coastal areas of all Australian states. It is widespread in Victoria, including the offshore islands. Corner Inlet is a site of international importance with 13,139 individual recorded. The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass, and sometimes, in nearby saltmarsh.	N	Y	Y	PMST: Species or species habitat known to occur in the cable envelopes Marine Ecological Assessment: The Bar-tailed Godwit breeds in north Eurasia and moves south for the Northern Hemisphere winter. Birds in New Zealand and south-east Australia breed mostly in Siberia and Alaska. Upon arrival, many stay in north-east Australia, but large numbers reach Victoria. They arrive in east Queensland and probably move south down the coast. The Bar-tailed Godwit is a regular to Tasmania. Species known to occur in the area, with significant population at adjacent Corner Inlet (13,139 individual recorded). Forages on the edge of water, or in shallow water, mainly in tidal estuaries or soft mud. May migrate through the OWF Site as they migrate to and from Tasmania.	Low	Low	High
Ruddy Turnstone	<i>Arenaria interpres</i>	Vulnerable	Migratory	Endangered	The Ruddy Turnstone is a medium sized wader with a black or dark brown chest and orange-red legs. The species is widespread within Australia during its non-breeding period of the year, occurring in coastal areas from Tasmania to Darwin. It strongly prefers rocky shores or beaches where there are large deposits of rotting seaweed.	N	Y (VBA search, not PMST)	Y (VBA search, not PMST)	PMST: Not identified in the PMST search. Species identified in the VBA search. Marine Ecological Assessment: The Ruddy Turnstone is migratory, with six recognised populations breeding on the coasts of Europe, Asia and North America moving south to non-breeding areas with a partial overlap of populations on passage. There may be two migration routes to Australia, with birds occurring in east Australia and New Zealand arriving from a migration south across the Pacific from east Asia and returning north via the east coast of Asia. Widespread across Australia from Tasmania in the south to Darwin in the north and many coastal areas in between. Species known to occur in the area, with known activity at adjacent Corner Inlet. Multiple records on shoreline and shallow waters of NCE and adjacent area. Preferable habitat is rocky shorelines. May migrate through the OWF Site as they migrate to and from Tasmania.	Low	Moderate	Moderate
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Vulnerable	Migratory	N/A	The Sharp-tailed Sandpiper is a small-medium wader. The species spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Y	Y	Y	PMST: Species or species habitat known to occur within cable envelopes, may occur in OWF Site Marine Ecological Assessment: The Sharp-tailed Sandpiper breeds in northern Siberia and migrates to non-breeding areas south of the Equator. During the non-breeding season, most of the world population occurs in Australia. After arriving in northwest Australia, most birds move slowly south across the continent to south-east Australia as far as Tasmania. In Tasmania, they mostly occur in coastal areas in the east from George Town to Hobart, with scattered records on the north-west coast, and west coast from Henty River and Port Davey. They also occur occasionally on Bass Strait islands. Gippsland Lakes host an important population (3,187 individuals). Species known to occur in the area. Multiple records on shoreline and shallow waters of OCE and surrounding areas. Forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. May migrate through the OWF Site as they migrate to and from Tasmania.	Moderate	High	High

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) Justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (COWTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Common Sandpiper	<i>Actitis hypoleucos</i>	N/A	Migratory	Vulnerable	The Common Sandpiper is a smaller brown and white sandpiper. Often found singularly or in small groups, the Common Sandpiper avoids areas with congregations of more gregarious waders. However, the species will form flocks of up to 200 individuals prior to migration movements. Found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers. The population when in Australia is concentrated in northern and western Australia. The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats.	Y	Y	Y	PMST: Species or species habitat known to occur in the cable envelope search areas, may occur in the OWF Site Marine Ecological Assessment: The population that migrates to Australia breeds in the Russian far east. Species utilises the EAAF. Widespread in Australia, particularly northern and western regions. Uncommon in Victoria, however multiple records in nearby Corner Inlet. Also found in Tasmania. The southern migration passage is said to be mostly diurnal, whereas the northern passage mainly occurs by night. Habitat known to occur in the area. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. May migrate through the OWF Site as they migrate to and from Tasmania.	Low	Low	Low
Double-banded Plover	<i>Charadrius bicinctus</i>	N/A	Migratory	N/A	The Double-banded Plover is a medium sized dotterel. The species can be found in both coastal and inland areas. During the non-breeding season, it is common in eastern and southern Australia. The greatest numbers are found in Tasmania and Victoria. The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological Assessment: The Double-banded Plover breeds only in New Zealand. In the non-breeding season, part of the population migrates to Australia. It is common in eastern and southern Australia, with greatest numbers in Tasmania and Victoria. It is unique among waders in that much of the population undertakes an east-west migration. Birds breeding inland on the southern South Island of NZ migrate to Australia. Species known to occur at nearby Corner Inlet (maximum population count of 800). Multiple records on shorelines and shallow waters of NCE and adjacent areas. Habitat known to occur in the cable envelope. Forages on vegetated shingle beds, closely cropped pasture, tilled ground and mudflats. May migrate through the OWF Site as they migrate from NZ to and from Victoria and SA.	Low	Moderate	Moderate
Pectoral Sandpiper	<i>Calidris melanotos</i>	N/A	Migratory	N/A	The Pectoral Sandpiper is a small-medium yellowish brown sandpiper. The species is found across Australia, however in low abundance. In Victoria the Pectoral Sandpiper is mainly found from Port Phillip Bay and the valley of the Murray River. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation	Y	Y	Y	PMST: Species or species habitat known to occur in the cable envelopes, may occur in the OWF Site Marine Ecological Assessment: The Pectoral Sandpiper breeds in northern Russia and North America. Some migrate to Australia during the non-breeding season and are widespread but with low abundance. In Victoria it is mainly found from Port Phillip Bay and the valley of the Murray River and has also been recorded at Coronet Bay (in Westernport Bay), Wimmera and Mallee. In Tasmania the Pectoral Sandpiper is very rare. Habitat known to occur in the area. Sparse distribution in Victoria, however species utilises the EAAF, including nearby Corner Inlet.	Unlikely	Unlikely	Unlikely
Red-necked Stint	<i>Calidris ruficollis</i>	N/A	Migratory	N/A	The Red-necked Stint is the smallest shorebird in Australia. It is distributed along most of the Australian coastline with large densities on the Victorian and Tasmanian coasts. In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological Assessment: The Red-necked Stint breeds in Siberia and west Alaska then moves to non-breeding areas in south-east Asia and Australasia. It is distributed along most of the Australian coastline with large densities on the Victorian and Tasmanian coasts. Species known to occur at nearby Corner and Shallow Inlets (population of approximately 20,338). Habitat known to occur in the cable envelopes. Mostly forages on bare wet mud on intertidal mudflats or sandflats, or in very shallow water; mostly in areas with a film of surface water and mostly close to edge of water. May migrate through the OWF Site as they migrate to and from Tasmania.	Low	Moderate	Moderate
Oriental Plover	<i>Charadrius veredus</i>	N/A	Migratory	N/A	The Oriental Plover is an elegant, medium-sized plover with long legs. The Oriental Plover is a non-breeding visitor to Australia, where the species occurs in both coastal and inland areas, mostly in northern Australia. There are occasional records in northern Victoria in mid-Murray Valley. Immediately after arriving in non-breeding grounds in northern Australia, Oriental Plovers spend a few weeks in coastal habitats in northern Australia before dispersing further inland. Thereafter they usually inhabit flat, open, semi-arid or arid grasslands interspersed with hard, bare ground. At the onset of the Wet Season, some may move into lightly wooded grasslands. Some remain in estuarine and littoral environments, and a few are occasionally recorded around terrestrial wetlands or flooded paddocks. Vagrants in southern Australia have been recorded in saltmarsh.	N	Y	Y	PMST: Species or species habitat known to occur in the area Marine Ecological Assessment: The Oriental Plover breeds in the Northern Hemisphere and flies south for the boreal winter. In Australia, the species occurs in both coastal and inland areas, mostly in northern Australia. It is seldom recorded in southern Australia. Habitat known to occur in the area. Sparse distribution in Victoria, however two records on the shoreline and nearshore waters of the NCE. Species utilises the EAAF, including nearby Corner Inlet. Usually forage among short grass or on hard stony bare ground, but also on mudflats or among beachcast seaweed on beaches	No	Low	Low
Little Egret	<i>Egretta garzetta</i>	N/A	N/A	Endangered	Small snow-white heron with slender dark bill, blackish legs, and yellowish feet. Inhabits a wide variety of wetlands: lakes, rivers, marshes, estuaries—almost anywhere with small fish. Occurs as singles or small loose groups; nests and roosts communally. The Little Egret is found mainly in coastal and inland areas of northern, eastern and south-eastern Australia. It is common on the north, uncommon in the south, and only a winter visitor to Tasmania.	N	Y (VBA search, not PMST)	Y (VBA search, not PMST)	PMST: N/A. VBA search only Marine Ecological Assessment: Little egrets are found from Africa to Japan, western Europe, Asia, Australia and New Zealand. In Australia they occur mainly in the north and east. In Victoria, they are infrequently recorded and occur mainly in the west and north of the state in suitable wetlands. Habitat known to occur in the area. One record in the NCE, multiple records in Corner Inlet and adjacent coastal habitat. Forages in shallow waters, tidal mudflats, wetlands and mangroves.	No	Low	Low

Not in report

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) Justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (OWF WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Listed threatened/migratory fauna - Land birds												
Regent Honeyeater	<i>Anthochaera phrygia</i>	Critically Endangered	N/A	Critically Endangered	The regent honeyeater is a striking black and yellow bird that has a patchy distribution between south-east Queensland and central Victoria	N	Y	Y	PMST: Foraging, feeding or related behaviour likely to occur within cable envelope search areas Marine Ecological Assessment: The regent honeyeater's movement through the landscape is governed by the flowering of select eucalypt species. It is nomadic and partly migratory, with some predictable seasonal movements observed. Strictly terrestrial species. No records on shorelines or coastal environments overlapping cable envelopes or adjacent areas.	No	No	No
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Endangered	N/A	N/A	The Gang-Gang Cockatoo is a small, stocky cockatoo, readily distinguished by their plumage (especially in males with their scarlet coloured heads). This species occurs primarily within the temperate eucalypt forest and woodland of south-east Australia. It migrates from higher altitudes in summer, to lower altitudes in winter. Species utilises mature forests, as well as eucalypt shrub assemblages and sparser woodlands. It is likely that habitat critical to the survival to the species is present within the Study Area (eucalypt assemblages or coastal thickets of leptospermum or Casuarina)	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelope search areas Marine Ecological Assessment: Strictly terrestrial species endemic to south-eastern Australia. In Victoria, the Gang-gang Cockatoo is widespread through northeast and southern regions, with some records in east Melbourne, Mornington Peninsula, and south-western Gippsland. Multiple records in coastal environments in areas adjacent the NCE.	No	No	No
Grey Falcon	<i>Falco hypoleucos</i>	Vulnerable	N/A	Vulnerable	Grey Falcon is distributed sparsely over Australia's arid and semi-arid zones. This species prefers arid and semi-arid Australia and frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined watercourses. This species has also been observed in treeless areas, frequenting tussock grassland and open woodland for foraging. This species is noted as absent from south of the Great Dividing Range in Victoria.	N	N	Y	PMST: Species or species habitat likely to occur within NCE search area Marine Ecological Assessment: The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia. The species appears to be absent south of the Great Dividing Range in Victoria. There are no records within the OWF or cable envelopes. Strictly terrestrial species.	No	No	No
Painted Honeyeater	<i>Grantia picta</i>	Vulnerable	N/A	Vulnerable	The painted honeyeater is endemic to Australia and is found across eastern and northern parts of the country. Over spring and summer its distribution stretches from inland central Victoria through scattered parts of much of New South Wales and the ACT and into southern Queensland. The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box, and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelope search areas Marine Ecological Assessment: The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The greatest concentrations and almost all records of breeding come from south of 26°S, on inland slopes of the Great Dividing Range between the Grampians, Victoria and Queensland. Many birds move after breeding to semi-arid regions in SA, QLD and NT. There are no records within the OWF or cable envelopes. Strictly terrestrial species.	No	No	No
Swift Parrot	<i>Lathamus discolor</i>	Critically Endangered	N/A	Critically Endangered	The Swift Parrot is a slim, medium-sized parrot with a streamlined shape in flight, angular pointed wings and a long pointed purple-red tail. The body is mostly bright green, with a dark blue patch on the crown. The forehead to throat is crimson and there is a crimson patch at the bend of the wing. The female is slightly duller, with a creamy underwing bar. Habitat in Victoria is primarily associated with Box-Ironbark assemblages, however foraging and roosting can be in a variety of mature, reliably flowering eucalypts.	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelopes Marine Ecological Assessment: During summer, it breeds in colonies in blue gum forest of south-east Tasmania. Infrequent breeding also occurs in north-west Tasmania. The entire population migrates to the Australian mainland for winter. On the mainland it disperses widely. The birds mostly occur on inland slopes, but occasionally occur on the coast. The migration pathway is not defined, but it is possible that some individuals could pass through the OWF Site and cable envelopes.	Moderate	Moderate	Moderate
Yellow Wagtail	<i>Motacilla flava</i>	N/A	Migratory	N/A	This species occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppes and grassy tundra. In the north of its range it is also found in large forest clearings. The species is almost wholly migratory with European populations wintering in sub-Saharan Africa, central and eastern populations mainly migrate to South Asia with some moving to Africa.	N	Y	Y	PMST: Species or species habitat may occur within the cable envelopes Marine Ecological assessment: The Yellow Wagtail is a regular wet season visitor to northern Australia. The species is considered a vagrant to Victoria, South Australia and southern Western Australia. Habitat requirements are highly variable, but typically include open grassy flats near water. Terrestrial species listed as overfly marine. There are no records within the OWF Site or cable envelopes, but suitable habitat may be present in adjacent damp habitats.	Unlikely	Unlikely	Unlikely
Satin Flycatcher	<i>Mylagra cyanoleuca</i>	N/A	Migratory	N/A	The Satin Flycatcher is a member of the Dicruridae family. They have a length around 17.5 cm, a wingspan of 23 cm and a weight of 17 g. The species is characterised by an upright posture, short erectile crest, and a distinctive habit of quivering the tail when perched. Males are glossy blue-black above, with a blue-black chest and white below, while females are duskier blue-black above, with a orange-red chin, throat and breast, and white underparts and pale-edged wing and tail feathers.	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelopes Marine Ecological assessment: Satin Flycatchers are migratory, moving north in autumn to spend winter in northern Australia and New Guinea. They return south in spring to spend summer in south-eastern Australia. In Victoria, the species is widespread in the south and east, in the area south of a line joining Numurkah, Maldon, the northern Grampians, Balmoral and Nelson. In Tasmania, they are widespread in the east, though they are recorded farther west along the northern coast and in the north-west, and are very occasionally recorded at scattered sites near the western coast. In Victoria, they depart on their northern migration mainly through eastern Victoria. At Wilsons Promontory, they have been recorded on their northern passage, presumably from Tasmania. Satin Flycatchers depart Tasmania between February and March to winter on the mainland. There are no records within the OWF Site or cable envelopes, but suitable habitat may be present in adjacent damp habitats. Terrestrial species listed as overfly marine. Some individuals could pass through the OWF Site and cable envelopes on migration.	Low	Low	Low

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (OWF+STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Rufous Fantail	<i>Rhipidura rufifrons</i>	N/A	Migratory	N/A	Rufous Fantail adults are medium sized birds, generally ranging from 14.5–18.5 cm in length. The forehead is a rich reddish-brown colour across the eyes. The eyes have a white arc underneath. The top of the head, back of the neck and the upper back, transition from an olive to reddish-brown colour, which then blends into a blackish-brown, long, fan-shaped tail. This blackish-brown tail, contrasts with the base of the tail, which is tipped with a paler colour, often white. In Australia this species is considered to be common and secure and there is no evidence of population change. All subspecies of Rufous Fantail inhabit moist, dense habitats, including mangroves, rainforest, riparian forests and thickets, and wet eucalypt forests. Structural features of suitable habitat include a moderately dense canopy cover often with two lower strata	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelopes Marine Ecological assessment: The Rufous Fantail occurs in coastal and near coastal districts of northern and eastern Australia. It has breeding populations occurring from about the SA-Victoria border, through south and central Victoria, and north to about the NSW-Queensland border. It winters in northern Australia and PNG. The species has multiple records within the study area shoreline and adjacent coastal environments. Habitat for this species is common throughout the Study Area. Strictly terrestrial species listed as overfly marine.	Unlikely	Unlikely	Unlikely
White-throated Needletail	<i>Hirundopus caudocutus</i>	Vulnerable	Migratory	Vulnerable	Large swift with a thickset, cigar-shaped body, stubby tail and long pointed wings. Migratory species that is almost exclusively aerial within Australia. Occurs over most types of habitat, but recorded most often above wooded areas including open forest and rainforest. Mainly occurs within Australia during non-breeding season from September to November.	N	Y	Y	PMST: Species or species habitat known to occur within cable envelopes Marine Ecological assessment: The White-throated Needletail breeds in different parts of Asia and flies south for the boreal winter. It mainly enters Australia via the Torres Strait and moves south along the Great Dividing Range in Queensland and NSW to the southern parts of their range in Victoria and Tasmania. The species has multiple records within the study area shoreline and adjacent coastal environments. Species is almost exclusively aerial and therefore may occur across many habitats in the Study Area and has a high potential for habitat utilisation. Strictly terrestrial species listed as overfly marine. Some individuals could pass through the OWF Site and cable envelopes on migration.	Low	Low	Low
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Endangered	N/A	Critically Endangered	The Australasian bittern inhabits shallow, permanent freshwater wetlands and brackish swamps or lagoons that are densely vegetated (e.g. tall reeds, sedges, lignum).	N	Y	Y	PMST: Species or species habitat likely to occur within cable envelopes. Marine Ecological Assessment: In Australia, the Australasian Bittern occurs from south-east Queensland to south-east SA, Tasmania and south-west WA. In Victoria, it is recorded mostly in the southern coastal areas and in the Murray River region of central northern Victoria. In Tasmania, the species occurs most commonly in the coastal regions in the north-east, the east coast and on the islands of Bass Strait. There are several records in coastal areas and wetlands adjacent the NCE. This species habitat includes wetlands, swamps or lagoons that are densely vegetated.	No	Unlikely	Unlikely
Pilotbird	<i>Pycnoptilus floccosus</i>	Vulnerable	N/A	N/A	Pilotbirds are small, plump, ground-dwelling birds. Pilotbirds are endemic to south-east Australia. Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne. Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth	N	Y	Y	PMST: Species or species habitat known to occur within cable envelope search areas. Marine Ecological Assessment: Pilotbirds are endemic to south-east Australia. Lowland Pilotbirds occur in forests from the Blue Mountains, around the wetter forests of eastern Australia, to Dandenong near Melbourne. There is one record in the adjacent coastal environment to the NCE. Suitable habitat may also be present in adjacent open woodlands. Strictly terrestrial and ground dwelling species.	No	No	No
South-eastern Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable	N/A	Critically Endangered	Glossy black cockatoos are the smallest of the black cockatoos. Plumage is mostly dull black, with a blackish-brown head, an inconspicuous crest and a broad bulbous bill. Adult males have bright red panels in the tail. South-eastern glossy black cockatoos are uncommon but widespread. They can be found in forests from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria	N	Y	Y	PMST: Species or species habitat may occur in cable envelope search areas Marine Ecological Assessment: South-eastern glossy black cockatoos are uncommon but widespread. They can be found from Queensland, through eastern NSW to East Gippsland, Victoria. There are no records within the OWF Site or cable envelopes, however suitable habitat may be present in adjacent open woodlands. Strictly terrestrial species.	No	No	No
Orange-bellied parrot	<i>Neophema chrysogaster</i>	Critically Endangered	N/A	Critically Endangered	The orange-bellied parrot is a small ground-feeding bird that migrates between distinct breeding and non-breeding ranges. Breeding occurs in south-west Tasmania in summer, and the birds overwinter in Victoria and South Australia for autumn and winter. The migration route follows the west coast of Tasmania, and at least some birds stop on King Island during the northward migration in autumn. Orange-bellied Parrots are seen almost exclusively in coastal and sub coastal areas, preferring peninsulas and islands. Saltmarshes, littoral (shore) heathlands and low scrublands are preferred habitats as well as grassy areas, which can include golf courses. They breed in forests on the west coast of Tasmania but tend to avoid extensive tracts of temperate rainforest. Non-breeding parrots feed on the seeds and flowers of low shrubs or prostrate vegetation, and roost in dense shrubs, usually within 10 km of the coast. The orange-bellied parrot is endemic to south-eastern Australia but fewer than 50 birds remain in the wild. The species is viewed as a flagship species in the fight against extinction and is particularly valued by community groups. Its identity also has created a unique eco-tourism industry with hundreds of tourists visiting known breeding locations every year.	N	Y	Y	PMST: Species or species habitat known to occur in cable envelope search areas Marine Ecological assessment: Species is known to occur in the area. Multiple records of the species in the coastal environment overlapping the NCE and adjacent area. There is potential for migrating individuals to occur in the coastal habitat of the NCE shoreline crossing and adjacent areas, however the cable envelopes and OWF Site are outside the most recent sightings and migration pathways. Furthermore, orange-bellied parrots nest and forage behind dunes and in adjacent coastal habitat, rather than on shorelines. Historically, the non-breeding range in Victoria extended from the Gippsland Lakes region, west to south Australia. However, records from 2000–2020 indicate range and migration pathways have restricted to Cape Patterson and Western Port Bay, west to South Australia. Occasionally they are seen out of their range. Captive-release programs in Victoria are focussed at The Spit, Lake Connewarre and North Western Port Bay. Species generally considered to occur onshore near the Project Area but occasional individuals could potentially overfly marine / coastal waters.	Low	Low	Low

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Listed threatened/migratory fauna - Mammals												
Blue Whale (Inc. subsp. Pygmy Blue Whale)	<i>Balaenoptera musculus / Balaenoptera musculus brevicauda</i>	Endangered	Migratory	Endangered	The main feeding areas are located west of the OWF Site and Offshore Cable Envelope, with the Bonney Upwelling considered the primary foraging area for blue whales in south eastern Australia, feeding is also known to occur in the area from Cape Otway to Port Phillip Heads and south to King Island, and is likely to occur in the majority of the Bass Strait and coastal waters of Tasmania. These areas are also considered to be BIAs for this reason	Y	Y	Y	PMST: Species or species habitat likely to occur within OWF Site search area and cable envelopes Marine ecological Assessment: Foraging (likely to occur) and distribution BIAs for Pygmy Blue Whales occurs in the OWF Site and cable envelopes. The main foraging habitat for the species is associated with upwellings off the coast of western Victoria and SE South Australia. Fewer records in the eastern Bass Strait. Foraging may occur but may be more opportunistic in nature.	High	High	Moderate
Southern Right Whale	<i>Eubalaena australis</i>	Endangered	Migratory (as <i>Balaena glacialis australis</i>)	Endangered	All waters offshore from Victoria to the 200 nm EEZ limit are considered a Migration BIA for this species (April-October). All Victorian waters to 2.5 km offshore are considered a Reproduction BIA (May-September), although numbers are likely to be low due to the low subpopulation size.	Y	Y	Y	PMST: Species or species habitat known to occur within OWF Site search area and cable envelopes Marine ecological Assessment: Species habitat is known to occur in the OWF site and cable envelopes. Migration BIA overlaps the OWF Site and cable envelopes. Reproduction BIA overlaps the NCE. Not considered to be an established breeding or calving site but known mother-calf records and mating behaviour recorded around Wilson's Promontory.	High	High	High
Sei Whale	<i>Balaenoptera borealis</i>	Vulnerable	Migratory	N/A	Sei whales have been infrequently recorded in Australian waters. Sei whales have been sighted 20-60 km offshore on the continental shelf in the Bonney Upwelling between November and May, and were reported 200 nautical miles south-west of Port Lincoln and at the western end of Bass Strait.	Y	Y	N	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and Offshore Cable Envelope Marine ecological Assessment: Given the wide-ranging behaviour of this species and the confirmed sightings of Sei Whales to the west and south of the Project Area, it is possible the species could occur in the Project Area, although sightings of this species are infrequent in Australian waters. Species was not listed in PMST search for Nearshore Cable Envelope. SPRAT distribution and ALA records indicate species may remain further offshore in deeper waters in this region and is less likely to occur in State coastal waters.	Moderate	Moderate	Low
Fin Whale	<i>Balaenoptera physalus</i>	Vulnerable	Migratory	N/A	Fin whale strandings have been reported in small numbers from Western Australia, South Australia, Victoria and Tasmania. Fin whales have been sighted inshore in the proximity of the Bonney Upwelling, Victoria, in the summer and autumn months during aerial surveys. Fin whales may migrate through the OWF and Offshore Cable Envelope, and possibly feed in the region, although numbers are likely to be low.	Y	Y	N	PMST: Foraging, feeding or related behaviour likely to occur within OWF Site search area and Offshore Cable Envelope Marine ecological Assessment: Given the wide-ranging behaviour of this species and the confirmed sightings of Fin Whales to the west of the Project Area, it is possible the species could occur in the area. Species was not listed in PMST search for the Nearshore Cable Envelope. SPRAT distribution and ALA records indicate species may remain further offshore in deeper waters in this region and is less likely to occur in State coastal waters.	Moderate	Moderate	Low
Pygmy right whale	<i>Caperea marginata</i>	N/A	Migratory	N/A	Pygmy right whales were observed in water depths of 150 m, approximately 4 km from the 200-m shelf break during aerial surveys near Portland, VIC. Strandings recorded at Phillip Island and Wilsons Promontory suggest this species may be encountered in nearshore waters.	Y	Y	Y	PMST: Foraging, feeding or related behaviour may occur within OWF Site search area and cable envelopes Marine ecological Assessment: Given strandings recorded at Wilsons Promontory and confirmed sightings of Pygmy Right Whales further west, Pygmy Right Whales may be encountered in nearshore waters.	Low	Low	Low
Dusky Dolphin	<i>Lagenorhynchus obscurus</i>	N/A	Migratory	N/A	The extent of occurrence and areas of occupancy of dusky dolphins in Australian waters is unknown due to the rarity of sightings records, however they occur across southern Australia, from WA to Tasmania, with confirmed sightings near Kangaroo Island, SA and off Tasmania and Victoria, and unconfirmed sightings south of continental Australia. All sightings of Dusky Dolphins in Australian waters have been correlated with abnormally warm sea surface temperatures. They are resident inshore for much of the year but are known to seek out colder water (<18 °C) as inshore temperatures rise in summer.	Y	Y	Y	PMST: Species or species habitat may occur within PMST search areas Marine ecological Assessment: Given their presence across southern Australia and the possible association with Southern Right Whales, dusky dolphins may be encountered in the OWF and cable envelopes.	Low	Low	Low
Humpback Whale	<i>Megaptera novaengliae</i>	N/A	Migratory	N/A (Southern Humpback Whales - Critically Endangered)	Humpback Whales are sighted in Victorian waters on their migration to and from low latitude breeding grounds, including sightings along the Gippsland coast. They travel north through Victoria in the highest numbers during June and July, with some whales passing by during their southern migration in September to October. Humpback Whale sightings have been recorded in Victoria in all months except February.	Y	Y	Y	PMST: Species or species habitat known to occur within PMST search areas Marine ecological Assessment: Humpback Whales are likely to be encountered migrating through the project area between May and November.	High	High	High
Killer Whale, Orca	<i>Orcinus orca</i>	N/A	Migratory	N/A	In Australia, Killer Whale sightings have been reported from all states, with concentrations reported around Tasmania and frequent sightings in South Australia and Victoria. In Victoria, Killer Whales were sighted each year from 2015-2019, including off Portland in August 2019. Killer Whales have also been sighted during aerial surveys in South Australian waters (eastern GAB to western Bass Strait) predominantly on the shelf close to the shelf break.	Y	Y	Y	PMST: Species or species habitat may occur within PMST search areas Marine ecological Assessment: Multiple records of Killer Whales around Wilson's Promontory, as well as further east along the Gippsland coast exist. Given the frequent sightings of killer whales in Victorian waters, and the confirmed sightings of killer whales in the Bonney Upwelling, killer whales may be encountered in the area.	Moderate	Moderate	Moderate
Long-nosed Fur Seal	<i>Arctophoca forsteri</i>	N/A	N/A	Vulnerable (<i>Arctophoca australis forsteri</i>)	A medium-sized seal with long, white whiskers and dark tan ears. Females are metallic on the back; paler underneath with a brown belly. Males have dark grey-brown dorsal fur, a pale muzzle, a pointed snout and a thick mane of long guard hairs. Males are much larger than females; around three times heavier. Pups are dark brown with silvery-grey fur on the head and neck. Inhabits rocky coastlines and offshore islands characterised by large, jumbled angular rocks, boulder-strewn beaches, smooth rock platforms and some vegetated areas.	Y	Y	Y	PMST: Species or species habitat may occur within OWF Site and cable envelopes. Marine ecological Assessment: Most of the Australian population of Long-nosed Fur Seals is in South Australia, between Kangaroo Island and the southern tip of the Eyre Peninsula. Breeding sites in Victoria include Cape Bridgewater, Kanowna Island, and the Skerries. The closest of these to the OWF Site and cable envelopes is Kanowna Island, approximately 52 km south-west of the western end of the OWF Site. Adults have been shown to feed up to 70-80 km away from breeding colonies. Long-nosed Fur Seals may therefore be encountered in the project area.	Low	Low	Low

Listed species or ecological community	Scientific Name	EPBC Act Threatened Listing	EPBC Act Migratory Listing	FFG Act Threatened Listing	Description	OWF Site Search	Offshore Cable Envelope Search	Offshore Cable Envelope (State Waters) Search	Likelihood of Occurrence (LoO) justification	LoO Outcome - OWF Site (No, Unlikely, Low, Moderate or High)	LoO Outcome - Offshore Cable Envelope (CWLTH WATERS ONLY) (No, Unlikely, Low, Moderate or High)	LoO Outcome - Nearshore Cable Envelope (STATE WATERS ONLY) (No, Unlikely, Low, Moderate or High)
Listed threatened/migratory fauna - Reptiles												
Leatherback Turtle, Leathery Turtle	<i>Dermochelys coriacea</i>	Endangered	Migratory	Critically Endangered	The Leatherback Turtle is a pelagic feeder, found in tropical, subtropical and temperate waters throughout the world. Large body size, high metabolism, a thick adipose tissue layer and regulation of blood flow allow them to utilise cold water foraging areas unlike other sea turtle species. For this reason this species is regularly found in the high latitudes of all oceans including the South Pacific Ocean in the waters offshore from Victoria. In the Bass Strait, leatherback turtles may congregate in areas where southward flowing warm currents converge with steep bathymetric contours.	Y	Y	Y	PMST: Species or species habitat known to occur within the OWF Site search area and cable envelopes Marine Ecological Assessment: This species has been recorded adjacent the cable envelopes and along most of the Victorian coastline. The northern Bass Strait is a significant feeding ground for Leatherback Turtles.	High	High	High
Loggerhead Turtle	<i>Caretta caretta</i>	Endangered	Migratory	N/A	Based on percentage of nesting females per year, approximately 2–4% of the total global population of Loggerhead Turtles occur in Australia. Loggerhead Turtle occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. While nesting is concentrated in southern Queensland and from Shark Bay to the North West Cape in Western Australia, foraging areas are more widely distributed.	Y	Y	Y	PMST: Species or species habitat known to occur within the OWF Site search area and cable envelopes Marine Ecological Assessment: Strandings of this species have been recorded at Wilson's Promontory but not in the OWF Site or cable envelopes and loggerheads are generally uncommon in Victorian waters.	Moderate	Moderate	Moderate
Green Turtle	<i>Chelonia mydas</i>	Vulnerable	Migratory	N/A	Green Turtles nest, forage and migrate across tropical northern Australia. They usually occur between the 20°C isotherms, although individuals can stray into temperate waters.	Y	Y	Y	PMST: Species or species habitat may occur within the OWF Site search area and cable envelopes Marine Ecological assessment: No records in OWF or cable envelopes. Five records around Wilsons Promontory. Green turtles are generally uncommon in Victorian waters.	Low	Low	Low
Listed threatened/migratory fauna - Fish												
White Shark, Great White Shark	<i>Carcharodon carcharias</i>	Vulnerable	Migratory	Endangered	In Australia, Great White Sharks have been sighted in all coastal areas except in the Northern Territory. Within Australian waters, the majority of recorded great white shark movements occur between the coast and the 100 metre depth contour. Both adults and juveniles have been recorded diving to depths of 1000 metres. Juveniles appear to aggregate seasonally in certain key areas including the 90 Mile Beach area of eastern Victoria, and the Portland region of western Victoria.	Y	Y	Y	PMST: Breeding known to occur within the PMST search areas Marine ecological Assessment: Breeding (nursery area) and distribution BAs overlap the OWF Site and cable envelopes. Foraging, feeding or related behaviour also known to occur within the OWF Site and cable envelopes.	High	High	High
Eastern Dwarf Galaxias, Dwarf Galaxias	<i>Galaxiella pusilla</i>	Endangered	N/A	Endangered	The Eastern Dwarf Galaxias is a tiny, slender, freshwater fish that averages 30-40 mm in length. Like other Galaxiidae, it has all soft-rayed fins, a body lacking scales, and a single dorsal fin positioned well back on the body. Population distribution is patchy and unknown due to habitat being lowland, shallow and swampy. Eastern Dwarf Galaxias has broad habitat requirements and occurs in slow flowing and still, shallow, permanent and temporary freshwater habitats such as swamps, drains and the backwaters of streams and creeks, often (but not always) containing dense aquatic macrophytes and emergent plants	N	Y	Y	PMST: Species or species habitat may occur within the cable envelopes Marine Ecological assessment: No records within the cable envelopes or OWF, however suitable habitat may be present in adjacent freshwater habitats. Strictly freshwater species	No	No	No
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupinf Shark	<i>Galeorhinus galeus</i>	Conservation Dependent	N/A	N/A	A widespread mainly coastal and bottom associated shark found in temperate areas over the continental shelf to about 800 m on the continental slope. Recorded in Australia from Moreton Bay (Qld) to Perth (WA), including Tasmania and Lord Howe Island.	Y	Y	Y	PMST: Species or species habitat likely to occur within area Marine Ecological assessment: Multiple records throughout OWF and cable envelopes and surrounding offshore and inshore waters.	High	High	High
Shortfin Mako, Mako Shark	<i>Isurus paucus</i>	N/A	Migratory	N/A	The shortfin mako shark, also known as the blue pointer or bonito shark, is a large mackerel shark. It is commonly referred to as the mako shark, as is the longfin mako shark. The shortfin mako can reach a size of 4 m in length. The species is classified as Endangered by the IUCN.	Y	Y	N	PMST: Species or species habitat likely to occur within OWF Site and OCE search areas. Marine ecological Assessment: Multiple records throughout OWF and OCE and surrounding offshore and inshore waters.	High	High	High
Porbeagle, Mackerel Shark	<i>Lamna nasus</i>	N/A	Migratory	N/A	The Porbeagle is wide-ranging and inhabits temperate, subarctic and subantarctic waters of the North Atlantic and Southern Hemisphere. In Australia, the species occurs in waters from southern Queensland to south-west Australia. Animals typically occur in oceanic waters off the continental shelf, although they occasionally enter coastal waters.	Y	Y	Y	PMST: Species or species habitat likely to occur within area Marine ecological Assessment: No records in OWF and cable envelopes or adjacent waters, however suitable habitat is likely to occur.	Low	Low	Low
Macquarie Perch	<i>Macquaria australasica</i>	Endangered	N/A	Endangered	Naturally a riverine fish, preferring deep holes. Cool, upper reaches of Victorian tributaries of the Murray-Darling system. Does well in impoundments with suitable spawning streams (Victoria's best population is in Lake Dartmouth where this large lake is fed by suitable shallow spawning streams including the Mitta Mitta River).	N	Y (VBA search, not PMST)	Y (VBA search, not PMST)	PMST: N/A - Species identified through VBA searches for cable envelopes and 10 km marine buffers. Marine ecological Assessment: No records within the cable envelopes or OWF, however suitable habitat may be present in adjacent freshwater habitats. Strictly freshwater species	No	No	No
Australian Grayling	<i>Prototroctes maraena</i>	Vulnerable	N/A	Endangered	Dark green to dark grey fish with silvery sides and a dark mid-lateral stripe. Fish are born in freshwater then migrate to the ocean as juveniles where they grow to adults before migrating back into freshwater to spawn. In Victoria, this species had been most frequently collected in the Tambo, Barwon, Mitchell and Tarwin River systems.	Y	Y	N	PMST: Species or species habitat is likely to occur within OCE search area and may occur in OWF Site. Marine ecological Assessment: No records within the cable envelopes or OWF, however the Australian Grayling is a diadromous species that spends its larval stages in marine water.	Unlikely	Low	Low
Whale Shark	<i>Rhincodon typus</i>	Vulnerable	Migratory	N/A	In Australia, Whale Sharks occur mainly off northern Australia, with patchy records from other states. The whale shark is found in open waters of the tropical oceans and is rarely found in water below 21 °C (70 °F)	Y	Y	Y	PMST: Species or species habitat may occur within area Marine Ecological assessment: No records in OWF and cable envelopes or adjacent waters. Suitable habitat is may occur, however water temperature is not favourable and whale sharks are unlikely to be present.	Unlikely	Unlikely	Unlikely



ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING
COUNTRIES AND TERRITORIES WORLDWIDE

Argentina	The Netherlands
Australia	New Zealand
Belgium	Peru
Brazil	Poland
Canada	Portugal
China	Romania
Colombia	Senegal
France	Singapore
Germany	South Africa
Ghana	South Korea
Guyana	Spain
Hong Kong	Switzerland
India	Taiwan
Indonesia	Tanzania
Ireland	Thailand
Italy	UAE
Japan	UK
Kazakhstan	US
Kenya	Vietnam
Malaysia	
Mexico	
Mozambique	

ERM's Melbourne Office

Level 8, 501 Swanston Street
Melbourne, VIC 3000
Australia

T +61 3 9696 8011

F +61 3 9696 8022

www.erm.com