Preliminary Marine Assessment Report

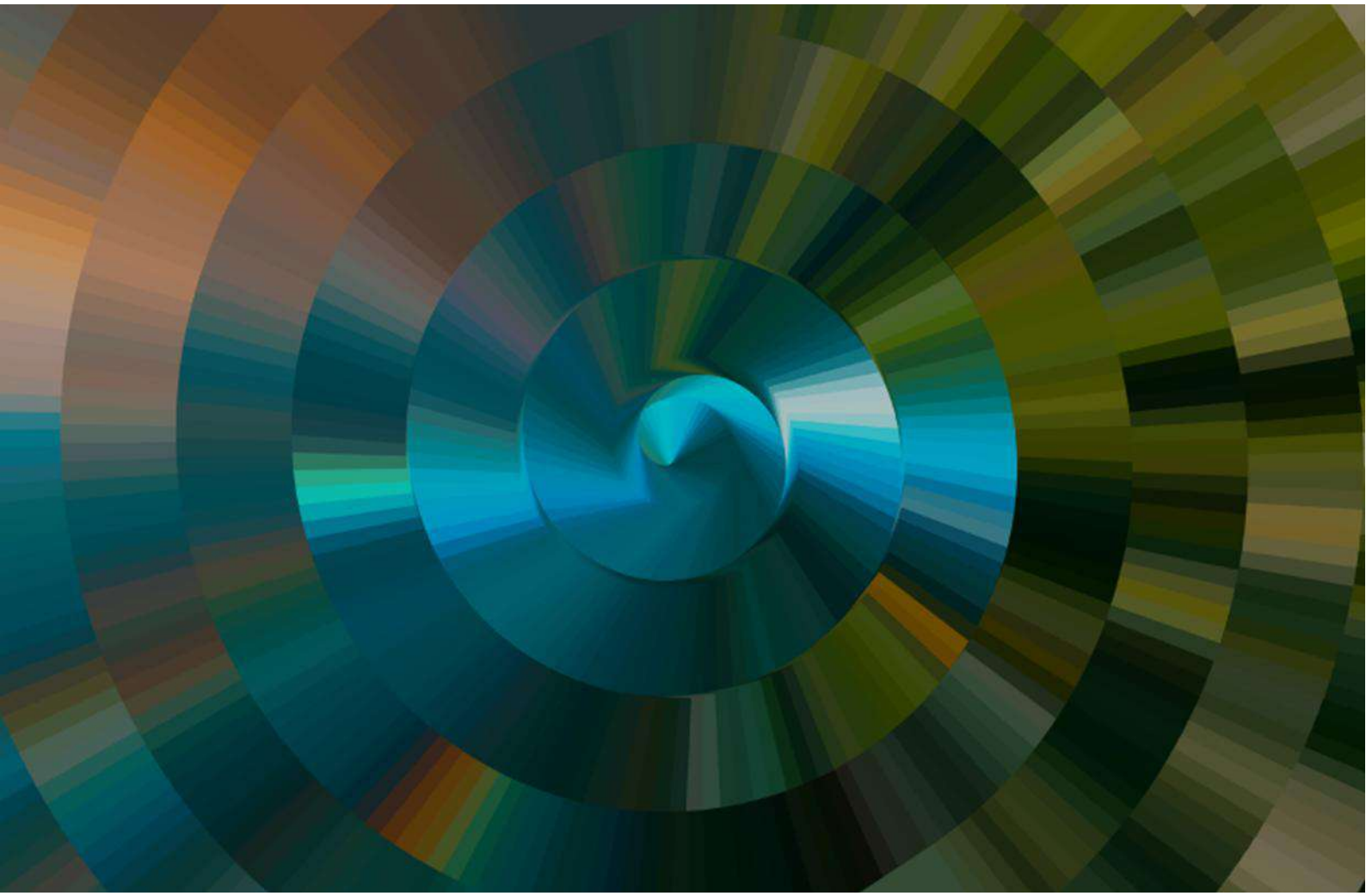
Aurora Green Offshore Wind Project

PREPARED FOR

Iberdrola Australia

DATE
27 February 2026

REFERENCE
0758202_RPT_EIA_009_V8



DOCUMENT DETAILS

DOCUMENT TITLE	Preliminary Marine Assessment Report
DOCUMENT SUBTITLE	Aurora Green Offshore Wind Project
PROJECT NUMBER	0758202_RPT_EIA_009_V8
DATE	27 February 2026
VERSION	V8
AUTHOR	D. Burns, N. Corne, D. Ottley, K. Woodborne, S. Ulrichs, E. Chung
CLIENT NAME	Iberdrola Australia OW 2 Pty Limited

DOCUMENT HISTORY

				ERM APPROVAL TO ISSUE		
VERSION	REVISION	AUTHOR	REVIEWED BY	NAME	DATE	COMMENTS
Draft	01	D. Burns, D. Ottley, K. Woodborne,	B. Parnum	J. Luk	11.03.2025	Draft for client
Final	02	D. Ottley, N. Corne	B. Parnum	J. Luk	19.08.2025	Final for client
Final	03	D. Ottley, S. Ulrichs	G. Murray	J. Luk	08.09.2025	Final for client
Final	04	E. Chung, S. Ulrichs	G. Murray	J. Luk	25.09.2025	Final for issue
Final	05	E. Chung	J. Luk	J. Luk	03.10.2025	Final
Final	06	E. Chung	G. Murray	J. Luk	07.10.2025	Final
Final	07	B. Parnum	B. Parnum	J. Luk	25.02.2026	Final
Final	08	D. Burns	B. Parnum	J. Luk	27.02.2026	Final

SIGNATURE PAGE

Preliminary Marine Assessment Report

Aurora Green Offshore Wind Project

0758202_RPT_EIA_009_V8

Jenny Luk
Partner

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

T +61 2 8584 8888

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym	Description
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AC	Alternating current
AFMA	Australian Fisheries Management Authority
AHO	Australian Hydrographic Office
AINJ	Auditory Injury
ALA	Atlas of Living Australia
AMSA	Australian Maritime Safety Authority
AMSIS	Australian Marine Spatial Information System
AUCHD	Australian Underwater Cultural Heritage Database
AUV	Autonomous underwater vehicle
BIA/s	Biologically important area/s
BOM	Bureau of Meteorology
BRUV	Baited remote underwater video
CAMRIS	Coastal and Marine Resources Information System
CASA	Civil Aviation Safety Authority
CASS	Coastal acid sulfate soils
CMP	Conservation management plan
CoA	Commonwealth of Australia
COLREGS	Convention on the International Regulations for Preventing Collisions at Sea
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Commonwealth Department of Agriculture, Fisheries and Forestry
DAWE	Commonwealth Department of Agriculture, Water and the Environment (predecessor to DCCEEW)
DC	Direct current
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DEECA	Victorian Department of Energy, Environment and Climate Action
DELWP	Victorian Department of Environment, Land, Water and Planning (predecessor to DTP and DEECA)
DETSI	Commonwealth Department of Environment, Tourism, Science and Innovation
DO	Dissolved oxygen
DoE	Commonwealth Department of Environment (predecessor to DCCEEW)
DoF	Commonwealth Department of Fisheries (predecessor to DAFF)
DP	Dynamic Positioning
DPA	Defence practice area

Acronym	Description
DSEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (predecessor to DCCEEW)
DTP	Victorian Department of Transport and Planning
EAA Flyway	East Asian-Australasian flyway
EAC	East Australian current
ECC	Export cable corridor
EE Act	*Environment Effects Act 1978*
EES	Environment Effects Statement
EIA	Environmental impact assessment
EMF	Electro-magnetic fields
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ESRI	Environmental Systems Research Institute
FFG Act	*Flora and Fauna Guarantee Act 1988*
GHG	Greenhouse gas
GIS	Geographic information system
GLaWAC	Gunaikurnai Land and Waters Aboriginal Corporation
GW	Gigawatt
HAT	Highest astronomical tide
HCTS	Habitat critical to the survival of the species
HVAC	High voltage alternating current
HVDC	High voltage direct current
HWM	High water mark
ID	Identity/identification
IMAS	Institute of marine and Antarctic studies
IMR	Inspection, maintenance and repair
IMS	Invasive marine species
IUCN	International Union for Conservation of Nature
KEF	Key ecological feature
LAT	Lowest astronomical tide
LiDAR	Light detection and ranging
MAL	Marine asset layer
MARPOL	The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (also known as MARPOL 73/78)
MDO	Marine diesel oil

Acronym	Description
MFE	Mass flow excavation
MGO	Marine gas oil
MKEF	Marine key ecological feature
MNES	Matters of national environmental significance
MNP	Marine national park
MPA/s	Marine protected areas
MSL	Mean sea level
MW	Megawatt
NATPLAN	National plan for maritime emergencies
NEM	National Electricity Market
NLPG	National Light Pollution Guidelines
nm	Nautical miles
NZ PB	New Zealand pygmy blue whales
OBP	Orange-bellied parrot
OEI Act	*Offshore electricity infrastructure Act 2021* (Cth)
OIR	Offshore Infrastructure Registrar
OIW	Oil in water
OWF	Offshore wind farm
PAM	Passive acoustic monitoring
P-CASS	Potential coastal acid sulfate soils
PMST	Protected Matters Search Tool
PTS	Permanent threshold shift
REZ	Renewable Energy Zone
ROV/s	Remote operated vehicles
SAC	South Australian current
SASW	Sub-Antarctic surface water
SBRUV	Stereo baited remote underwater video
SEER	Synthesis of Environmental Effects Research
SEMR	South east marine region
SOLAS	International Convention for the Safety of Life at Sea
SOPEP	Ship oil pollution emergency plan
SOWER	Southern Ocean whale and ecosystem research
SPRAT	Species profile and threats
SSCV	Semi-submersible crane vessel

Acronym	Description
SSHLV	Semi-Submersible heavy lift vessel
TECs	Threatened ecological communities
TP	Transition piece
TSGD	Trailing suction hopper dredger
TTS	Temporary threshold shift
UXO	Unexploded ordnance
VBA	Victorian Biodiversity Atlas
VFA	Victorian Fisheries Authority

EXECUTIVE SUMMARY

Iberdrola Australia OW 2 Pty Limited (**Iberdrola Australia**) proposes to construct and operate the Aurora Green Offshore Wind Project (the **Project**), a renewable energy development to be located off the Gippsland coast of Victoria, Australia.

The Project is a 3 GW offshore wind project located 25+ kms from the Gippsland coast comprising an offshore wind farm and a transmission system of cables and substations to transfer electricity generated offshore to the National Electricity Market via an onshore connection point to the electricity network.

Environmental Resources Management Australia Pty Ltd has been engaged by Iberdrola Australia as lead consultant to undertake environmental studies and assessments for the purpose of obtaining primary and secondary approvals for the Project.

A preliminary assessment of potential environmental impacts has been carried out to inform the project referrals under Commonwealth and Victorian legislation, environmental assessments and approvals, and project development processes. This desktop report documents the preliminary assessment and recommendations for further studies on the marine environment to inform the Project.

Assessment overview

It includes three main components:

- A desktop review of available information, to provide a description of the existing marine environment relevant to the Referral Area. It examines a wide Referral Area, within which a much smaller area (footprint) of potential direct and indirect impacts and disturbance is ultimately anticipated;
- A preliminary assessment of the potential for the Project to result in significant impacts on marine Matters of National Environmental Significance (**MNES**) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**); and
- A proposed study program of investigations and consultation to be undertaken to inform and support the detailed assessment process.

The preliminary assessment considered the following:

- Aspects relevant to Project activities during the different stages of the Project (i.e. Construction, Operation, and Decommissioning), that may result in environmental effects and impacts; and
- Key environmental impacts that may potentially arise from these aspects, and the key receptor groups that may be impacted.

Project aspects include those associated with both planned activities and the risk of unplanned events occurring (e.g. vessel strike).

The Project aspects and effects identified in this assessment are consistent with the key impact sources and pathways identified in Department of Climate Change, Energy, the Environment and Water's (**DCCEEW**) *Guidance on Key environmental factors for offshore windfarm environmental impact assessment under the EPBC Act 1999* (Commonwealth of Australia, 2023d). The report also considers the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978* (DTP, 2023).

Commonwealth Matters

The following MNES were identified as being relevant to the marine portion of the Referral Area:

- Fifty-five listed threatened species (4 critically endangered, 15 endangered, 36 vulnerable)
- Seventy-two listed migratory species
- The Commonwealth Marine area

The preliminary assessment found that there is potential for the Project to have a significant impact on listed threatened and migratory species, including listed birds, marine mammals and fish and shark species; and the Commonwealth marine area.

The Corner Inlet Ramsar site is located to the south-west, adjacent to the Referral Area. It has been assessed as unlikely that the Project would have a significant impact on this wetland.

Victorian Matters

The preliminary assessment has considered the following receptors, values and protected matters in Victoria:

- Species listed as threatened under the *Flora and Fauna Guarantee Act 1988* (**FFG Act**) with a likelihood to occur in the Referral Area.
- The health and biodiversity of marine ecosystems, including protected areas such as marine national parks, coastal parks and important wetlands located in proximity to the Referral Area
- Other marine users.

The preliminary assessment found that there is potential for a total of 49 FFG-listed species to occur in the Referral Area, many of which are also protected under the EPBC Act; there is potential for the Project to impact listed threatened species, including threatened birds, marine mammal, fish and shark species; and to impact other marine users, including commercial and recreational fisheries, boating, aviation and defence.

Potential effects on Victorian matters would be further assessed and impacts addressed through an assessment process under the *Environment Effects Act 1978* (**EE Act**), noting that there is some overlap of matters protected under both Commonwealth and Victorian legislation, and many of these Victorian matters would also be addressed via the EPBC process.

Overall, it is anticipated that the potential for significant impacts in the marine environment is primarily related to the Project activities proposed in the offshore wind farm area, located in Commonwealth waters about 25 km off the coast of Gippsland.

Project activities occurring within Victorian waters are mostly related to the installation of export cable infrastructure, which is anticipated to have a low potential for significant impact.

Proposed Marine Environmental Studies

There are currently uncertainties regarding species presence and habitat in the Referral Area. To ensure a robust assessment of impacts can be undertaken, a number of marine baseline field surveys are proposed, with some already underway. These include:

- Metocean monitoring;
- Geophysical and geotechnical site investigation;
- Marine water and sediment quality sampling;
- Benthic, epibenthic and intertidal ecology surveys;
- Fish ecology surveys;
- Marine mammals and other megafauna surveys; and
- Seabirds and shorebirds surveys.

Data gathered from baseline surveys and modelling studies will underpin the Project impact assessment, allowing for a robust evaluation of effects on environmental sensitivities, species and habitats. This assessment will inform mitigation strategies and control measures to ensure that potential adverse impacts are avoided and minimised so far as is reasonably practicable.

1. INTRODUCTION

Iberdrola Australia OW 2 Pty Limited (**Iberdrola Australia**) proposes to construct and operate the Aurora Green Offshore Wind Project (the **Project**), a renewable energy development to be located off the Gippsland coast of Victoria, Australia.

Environmental Resources Management Australia Pty Ltd (**ERM**) has been engaged by Iberdrola Australia as lead consultant to undertake environmental studies and assessments for the purpose of obtaining primary and secondary approvals for the Project.

A preliminary assessment of potential environmental impacts has been carried out to inform the environmental assessments and approvals, and project development processes. This desktop report documents the preliminary assessment and recommendations for further studies on the marine ecology to inform the Project.

1.1 PROJECT OVERVIEW

Aurora Green is a 3 GW offshore wind project being developed by Iberdrola Australia in Gippsland, located 25+ km from the coast. The Project is proposed offshore between Seaspray/Honeysuckles and Woodside Beach within Commonwealth's Declared Area OEI-01-2022 in Gippsland.

The electricity generated from the Project would be transmitted to a connection point onshore, via a transmission system of cables and substations, and would connect into the National Electricity Market (**NEM**) to deliver electricity to homes and businesses (Figure 1-1). With a proposed operational life of 30-40 years, the Project would be developed in stages to align with the development of the industry and supporting infrastructure.

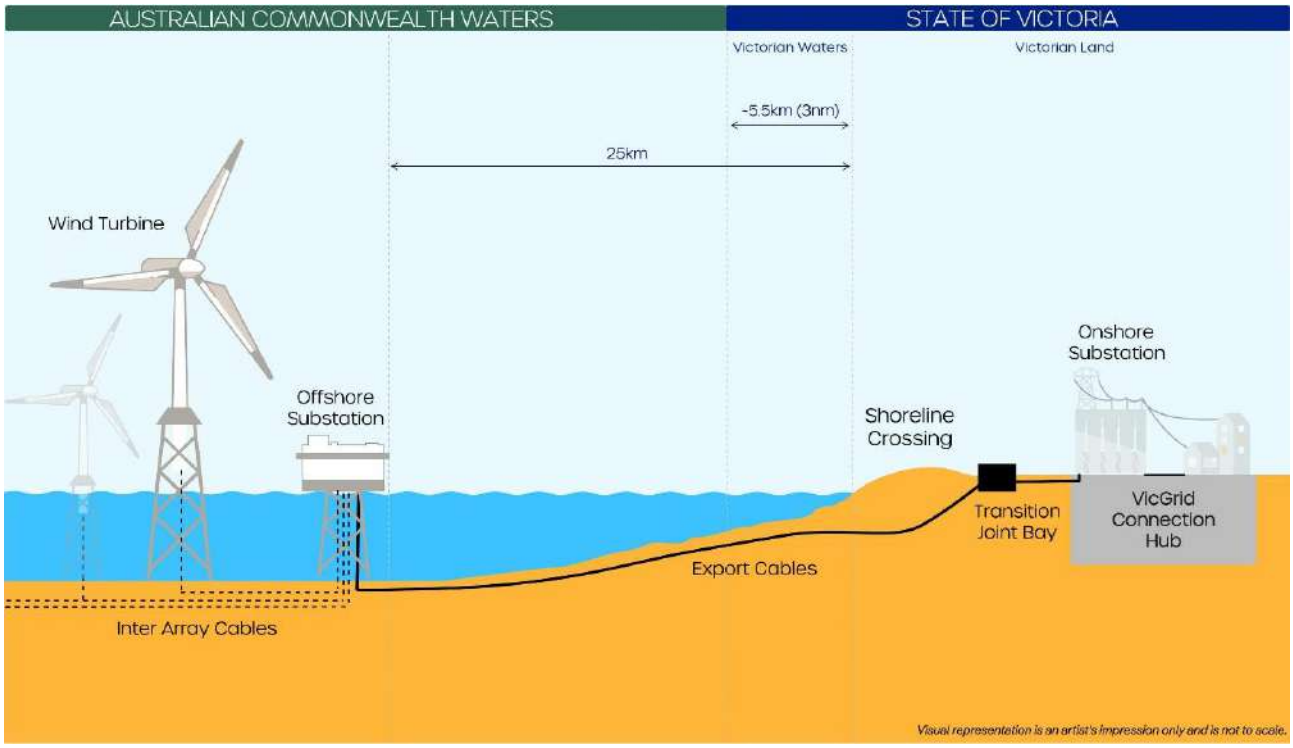


FIGURE 1-1 PROJECT COMPONENTS OVERVIEW (SECTION VIEW)

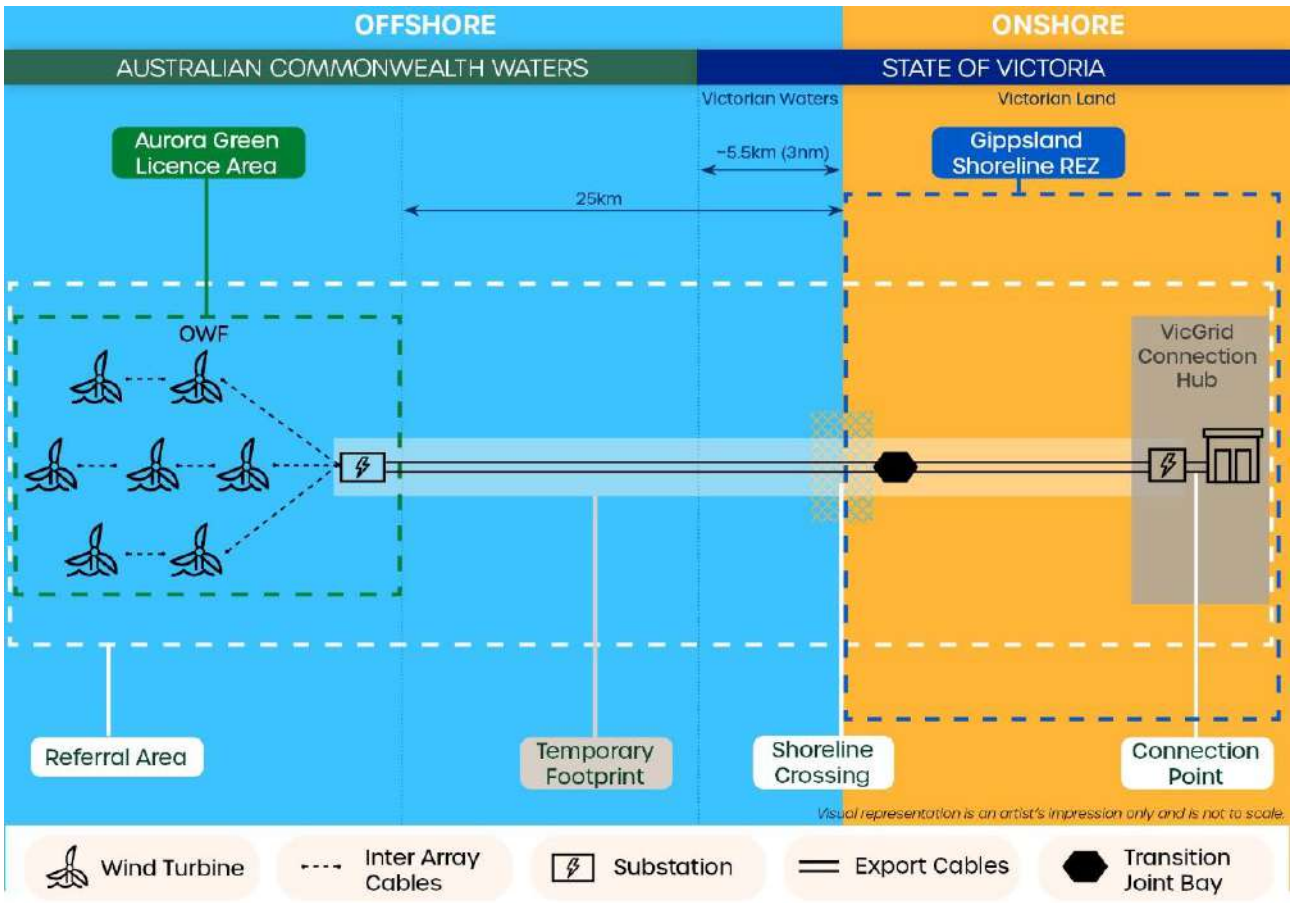


FIGURE 1-2 PROJECT COMPONENTS AND AREAS OVERVIEW (PLAN VIEW)

Once complete, it is expected that the delivery of the Project by Iberdrola Australia would provide the following benefits to the State of Victoria and Australia:

- Up to 3GW of offshore wind power generating capacity
- Clean energy to power up to 2.25 million households
- 600 long-lasting, skilled jobs during operation
- 1800+ jobs during construction
- $8 billion boost to the Victorian economy
- Grow and support local talent through apprenticeships, scholarships and research programs

The Project comprises both offshore and onshore components (described herein and illustrated in Figure 1-1 and Figure 1-2), and it is proposed to be developed within the Referral Area shown in Figure 1-3 and Figure 1-4.

- Offshore Wind farm (**OWF**), in Commonwealth waters, located between approximately 25 km and 50 km offshore between the towns of Woodside Beach and Seaspray/Honeysuckles, covering an area of 700 km^2, in water depth ranging from approximately 40 m to 60 m. The OWF would comprise up to approximately 150 wind turbines depending on the final design. It would also include inter-array cables (**IAC**), and offshore substation(s).

- Export Cable Corridor (**ECC**), to transmit the electricity generated from the turbines to the onshore connection point, encompassing offshore and onshore export cable portions spanning across both Commonwealth and Victorian State waters and land. The export cables would make landfall at a shore crossing location, with the offshore and onshore cable portions connected via underground cable transition joint bays. An Export Cable Corridor Investigation Area is currently being assessed to determine a final export cable corridor.
- Onshore connection point, comprising an onshore substation to be located within the VicGrid Connection Hub located in the Gippsland Shoreline Renewable Energy Zone (**REZ**).
- Operations and Maintenance (**O&M**) Facility, to support the ongoing operation and maintenance of the project. The O&M facility would be located at a nearby existing port. The O&M facility is not part of the Referral Area.

The delivery of the VicGrid Connection Hub does not form part of this Project. Iberdrola Australia would work with the party ultimately chosen by VicGrid to build, own and operate the transmission infrastructure in Gippsland that will facilitate the connection of Offshore Wind Developments in the region.

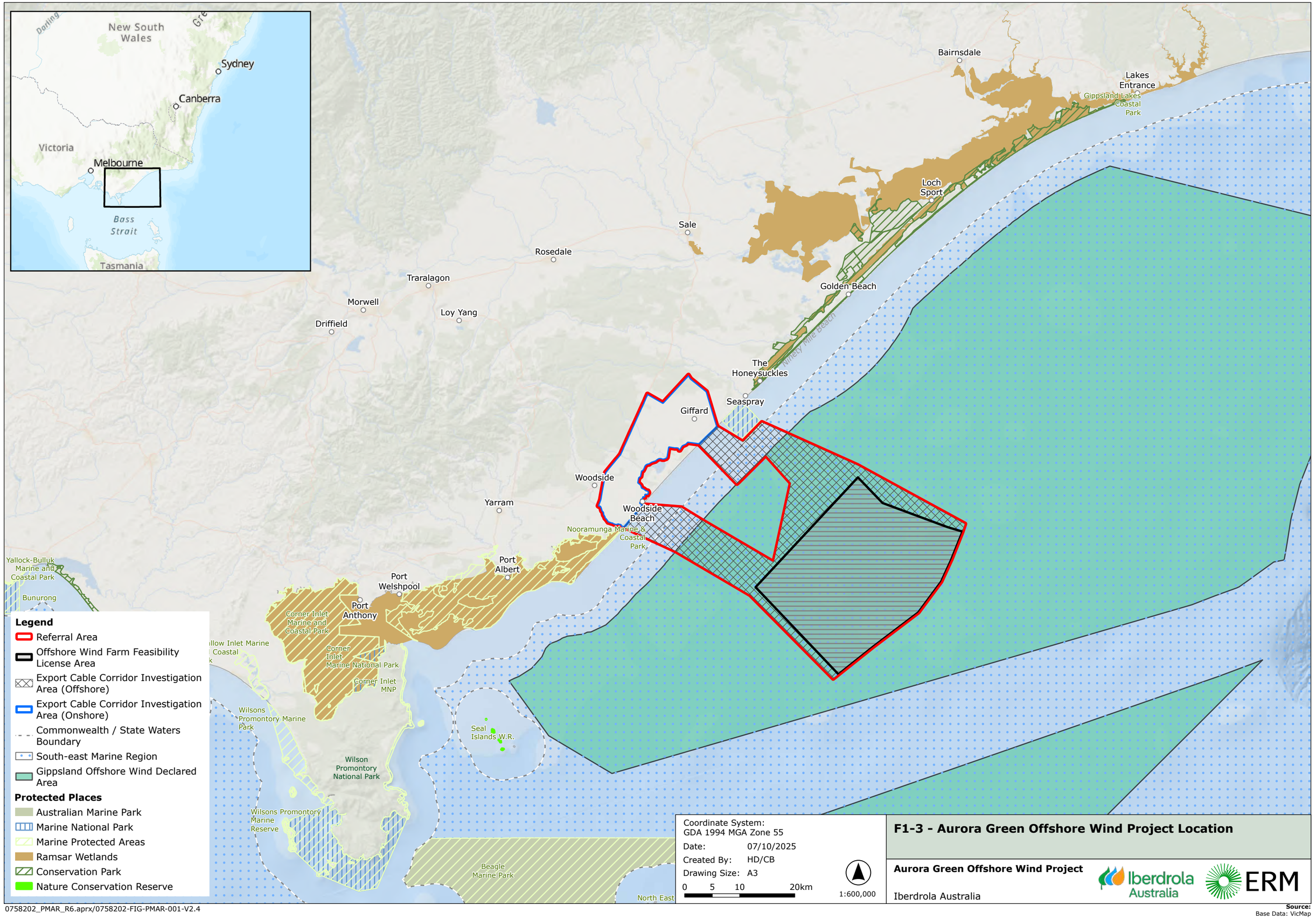
1.2 SCOPE AND PURPOSE

This Preliminary Marine Assessment Report has been prepared to assess the potential environmental impacts associated with the offshore components and activities of the Project to support the Project referrals under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) and the *Environment Effects Act 1978* (**EE Act**).

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
- Inform the early development and design of the Project.

This Preliminary Marine Assessment Report considers potential impacts resulting from the offshore components of the Project in Commonwealth and State waters, which includes the OWF and the offshore areas of the ECC, including the cable shore crossing locations and the intertidal zone only.



Coordinate System:
GDA 1994 MGA Zone 55

Date: 07/10/2025

Created By: HD/CB

Drawing Size: A3

0 5 10 20km

1:600,000

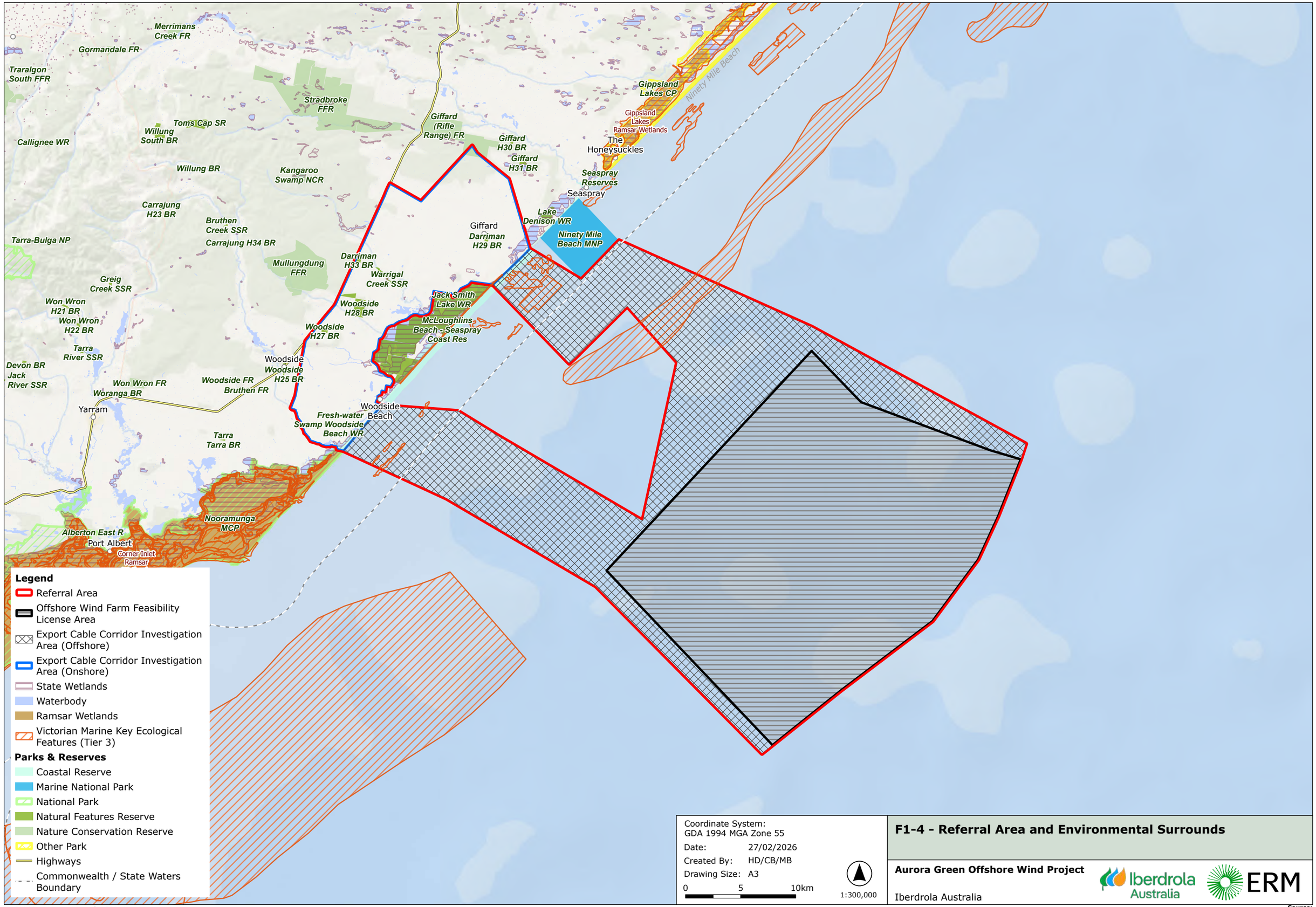
F1-3 - Aurora Green Offshore Wind Project Location

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-001-V2.4

Source:
Base Data: VicMap



Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- State Wetlands
- Waterbody
- Ramsar Wetlands
- Victorian Marine Key Ecological Features (Tier 3)

Parks & Reserves

- Coastal Reserve
- Marine National Park
- National Park
- Natural Features Reserve
- Nature Conservation Reserve
- Other Park
- Highways
- Commonwealth / State Waters Boundary

Coordinate System:
GDA 1994 MGA Zone 55

Date: 27/02/2026
Created By: HD/CB/MB
Drawing Size: A3

0 5 10km

1:300,000

F1-4 - Referral Area and Environmental Surrounds

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R7.aprx/0758202-FIG-PMAR-011-V1.1

Source:
Base Data: VicMap

2. LEGISLATIVE CONTEXT

Table 2-1 summarises the key Commonwealth and Victorian legislation applicable to the Project's marine activities.

TABLE 2-1 SUMMARY OF APPLICABLE LEGISLATION

Legislation	Description	Relevance to Project
Primary Approvals		
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999 (**EPBC Act**)	The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, habitats and places, which are defined in the EPBC Act as Matters of National Environmental Significance (**MNES**). Administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water (**DCCEEW**).	The report considers MNES that could be directly or indirectly impacted by the Project, with the assessment outcomes provided in Section 5.2
Offshore Electricity Infrastructure Act 2021 (**OEI Act**)	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. Administered by the Offshore Infrastructure Registrar (**OIR**).	Prior to commencing offshore infrastructure activities, a licence holder is required to submit a management plan to the OIR for assessment.
Victorian Legislation		
Environment Effects Act 1978 (**EE Act**)	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. Administered by the Department of Transport and Planning (**DTP**).	This report addresses the referral criteria outlined in the *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978* (DTP, 2023), focusing on marine matters, including the existing environment (see Section 4), and the Project's potential environmental effects and mitigation measures (see Section 5.1).
Marine and Coastal Act 2018	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 Department of Energy, Environment and Climate Action (**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 Referral Area.

Legislation	Description	Relevance to Project
Aboriginal Heritage Act 2006	The Act provides for the protection of Aboriginal cultural heritage in Victoria, applying to Victorian land and waters. The Act, among other matters, outlines requirements for cultural heritage management plans and cultural heritage permit processes, to manage activities that may impact First People's cultural heritage. Administered by First Peoples – State Relations.	Requirements of the Act are considered in the *Aurora Green Offshore Wind Project: Preliminary Heritage Assessment* (ERM, 2025a).
Secondary Consent		
Commonwealth Legislation		
Australian Maritime Safety Authority Act 1990	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. Administered by the Commonwealth Australian Maritime Safety Authority (**AMSA**).	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.
Biosecurity Act 2015	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**)). Administered by the Commonwealth Department of Agriculture, Fisheries and Forestry (**DAFF**).	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.
Environment Protection (Sea Dumping) Act 1981	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. Administered by DCCEEW.	Permits are required from DCCEEW for all ocean disposal activities such as cable burial using manuported materials (rock for armour/cable protection, etc). In the event that any Project infrastructure remains in-situ at the end of its use, a Sea Dumping Permit may be required. 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.

Legislation	Description	Relevance to Project
Fisheries Administration Act 1991	Relates to the management of Australian (Commonwealth managed) fisheries. Administered by the Australian Fisheries Management Authority (**AFMA**).	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 4.4.2.
Navigation Act 2012	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 *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* 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. Administered by AMSA.	Several Marine Orders are enacted under this Act that will apply to Project vessels, including but not limited to: • 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
Protection of the Sea (Prevention of Pollution from Ships) Act 1983	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**). Administered by AMSA.	Several Marine Orders are enacted under this Act that will apply to Project vessels, including but not limited to: • 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
Underwater Cultural Heritage Act 2018	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. Administered by DCCEEW.	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 *Aurora Green Offshore Wind Project: Preliminary Heritage Assessment* (ERM, 2025a).
Victorian Legislation		

Legislation	Description	Relevance to Project
Environment Protection Act 2017	The purpose of the legislation is to enhance protection of Victoria's environment and human health through a proportionate, risk-based environment protection framework. Administered by the Environment Protection Authority (**EPA**) Victoria.	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.
Emergency Management Act 2013	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.
Fisheries Act 1995	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 4.4.2.
Flora and Fauna Guarantee Act 1988	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. Administered by DEECA.	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.
Heritage Act 2017	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.	Project activities are required to not disturb or damage maritime heritage and to observe the requirements of protected zones. Potential impacts are considered in the *Aurora Green Offshore Wind Project: Preliminary Heritage Assessment* (ERM, 2025a).
Marine Safety Act 2010	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 Victorian waters. Administered by Maritime Safety Victoria.	Project vessels are required to implement a range of safety duties, ensure masters are licenced and specific navigational and pilotage requirements are adhered to.
National Parks Act 1975	Provides for the establishment of national parks, State parks, marine national parks and coastal parks. Administered by DEECA.	The Referral Area does not overlap with any marine national parks or coastal parks, however, a number of parks are in the broader vicinity (refer Section 4.3.3.4).
Pollution of Waters by Oil and Noxious Substances Act 1986	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.

Legislation	Description	Relevance to Project
Wildlife Act 1975	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. Administered by DEECA.	The Project may require authorisation for handling and managing fauna.

3. METHODOLOGY

For this marine assessment report, terrestrial aspects of the Referral Area have not been considered and the marine environment has been taken to mean all marine and coastal waters up to the LAT line. This assessment was informed through desktop activities only.

This marine assessment report included:

- Desktop review of available information, to provide a description of the existing marine environment relevant to the marine aspects of the Referral Area.
- Preliminary assessment of the potential for the Project to result in significant impacts on marine MNES protected under the EPBC Act. The assessment aims to also address referral particulars of the *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978*, specifically the project's potential environmental effects and preliminary mitigation measures for protected ecological matters.

The following sensitivities have been assessed separately:

- Cultural heritage values have been considered in the *Aurora Green Offshore Wind Project: Preliminary Heritage Assessment* (ERM, 2025a).
- Landscape and visual values have been considered in the *Aurora Green Offshore Wind Project: Preliminary Landscape and Visual Impact Appraisal* (Hansen Partnerships, 2025).
- Terrestrial ecology values have been considered in the *Aurora Green Offshore Wind Project: Preliminary Terrestrial Ecological Assessment* (ERM, 2025b).

3.1 DESKTOP REVIEW

A desktop review was undertaken to characterise the marine environmental and socio-economic existing environment relevant to the ECC and OWF area. The review includes a detailed analysis of physical, biological, and socio-economic values and sensitivities as well as an assessment of Commonwealth MNES and State protected matters.

Publicly accessible government databases and spatial data mapping tools accessed included:

- National databases
  - Protected Matters Search Tool (**PMST**)
  - Australian Marine Spatial Information System (**AMSIS**)
  - Species Profile and Threats (**SPRAT**) Database
  - Atlas of Living Australia (**ALA**)
  - Australian Wetlands Database
  - Seamap Australia
- Victorian databases
  - Victorian Biodiversity Atlas
  - NatureKit online mapping and data exploration tool
  - CoastKit online mapping and data exploration tool
  - VicPlan information service and online map viewer
  - Feature Activity Sensitivity Tool (**FeAST**)

- Victorian Marine Key Ecological Features Framework

A 5 km buffer around the Referral Area was applied to the PMST and the VBA database searches for consideration of migratory species, which resulted in some overlap with the terrestrial environment. As such some terrestrial communities and species not relevant to the marine assessment were identified; those considered to not interact with the marine environment were excluded from assessment. Further, the PMST identifies areas in which protected species have the potential to occur based on a conservative grid-based search function, which can result in a PMST report indicating the presence of MNES that do not actually intersect with the Referral Area. Verification of likely presence of MNES in the Referral Area has been undertaken by reviewing relevant shapefiles as provided by DCCEEW.

Other data and qualitative information obtained from Australian and Victorian Government departments include:

- DCCEEW – Marine bioregional profile for the south-east marine region, threatened species recovery plans / conservation management plans; key environmental factors guidance
- 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
- Offshore Wind Energy Victoria (**OWEV**) – overview of values, uses and activities in Gippsland's marine environment
- Victorian Fisheries Authority (**VFA**) – commercial fishing effort for State managed fisheries
- Agriculture Victoria – Coastal Acid Sulfate Soils distribution.

Other information presented in this report has been obtained from review of:

- Aerial imagery of the Referral 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
- Peer-reviewed scientific literature, as referenced within the report.

3.2 PRELIMINARY ASSESSMENT

The preliminary impact assessment included the following:

- Identification of potential impacts and mitigation – potential impacts to values and sensitivities associated with proposed Project activities in the Referral Area during all Project stages are identified and summarised, and preliminary mitigation measures included.

- Preliminary assessment of potentially significant impacts on MNES, consistent with the MNES Significant Impact Guidelines 1.1 (Commonwealth of Australia, 2013), with relevant marine MNES including:
  - Ramsar Wetlands;
  - Commonwealth Marine Area;
  - Listed Threatened Species and Ecological Communities (**TEC**s); and
  - Listed Migratory Species.

4. EXISTING ENVIRONMENT

This section describes the existing environment relevant to the OWF area and the ECC that may be affected by Project activities.

4.1 REGIONAL SETTING

The Commonwealth waters of the Referral Area are within the South-east Marine Region (**SEMR**) of the Bass Strait (Figure 4-1). The SEMR covers an area of approximately 1,632,402 km², including Commonwealth waters extending from southern New South Wales, around Tasmania, and up to Kangaroo Island in South Australia. This region is characterised by the geological features typical of the Gippsland Basin, such as platforms, terraces, and troughs. The region begins with shallow waters, with a maximum depth of about 80 m, before transitioning into a steep continental slope that descends to depths of approximately 5,000 m.

The region is known for having relatively low nutrient levels and primary productivity, though there are localised areas of higher productivity. These areas are linked to the Bonney Coast upwelling near the Victoria-South Australia border, the Bass Strait Water Cascade along the shelf break east of Bass Strait, and the East Australian Current (**EAC**) flowing along the region's eastern edge. These productive zones, along with notable variations in water depth and seafloor characteristics, play a key role in the region's designation as a major marine biogeographic area (Commonwealth of Australia, 2015a).

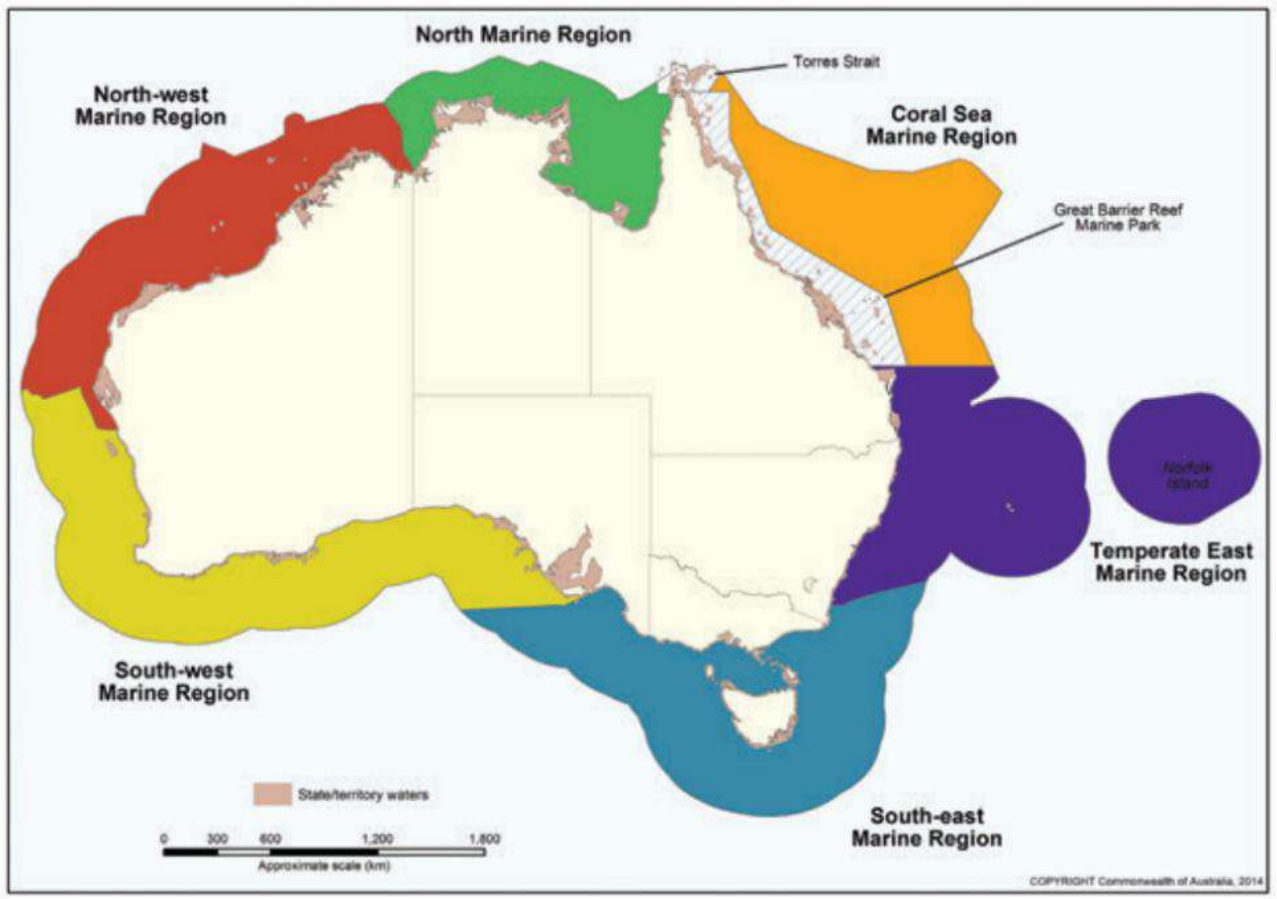


FIGURE 4-1 MARINE REGIONS OF AUSTRALIA

4.2 PHYSICAL ENVIRONMENT

4.2.1 BATHYMETRY AND SEABED MORPHOLOGY

Seafloor gradients are generally low in the region of the Referral Area, i.e., under 1°, except for areas in the vicinity of islands and beyond the shelf edges. The water depths at the OWF area range between approximately 40 m in the northern corner and approximately 60 along the south-eastern boundary, with a mean depth of 53.4 m (Figure 4-2).

From the shoreline to the OWF area, the water depth transitions at a relatively steady gradient offshore from with a relatively featureless profile from 0 m at the shoreline to approximately 45 m at the boundary of the OWF area. Figure 4-2 provides an indicative overview of the bathymetric cross-section.

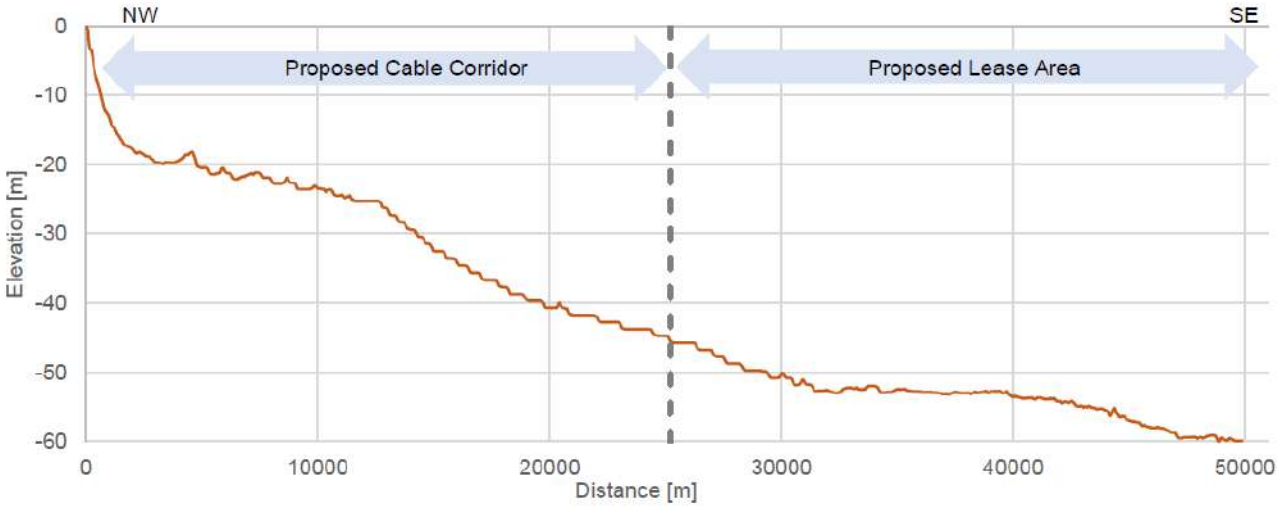


FIGURE 4-2 INDICATIVE BATHYMETRIC CROSS-SECTION

(Through the OWF area and eastern portion of the ECC, Proposed Lease Area = OWF area (WSP 2023b))

4.2.2 SEABED GEOLOGY

The upper sequence of sediments in OWF area is considered most likely to be composed of calcareous sands and gravels of biogenic origin. These transported sediments are largely composed of skeletal matter, such as shell fragments and eroded limestone, and are expected to have become cemented to varying degrees and at discrete depths. The surficial sand content at the OWF area varies from 71% to 98%, with nearly pure sand expected in the northern corner and along the southeastern boundary. The gravel content at the surface ranges from approximately 2% to 27%, with higher gravel concentrations predominantly located in the southwestern and western regions of the site. These areas of elevated gravel content are typically associated with lower sand concentrations (WSP 2023b).

As a general trend, the surficial sand content decreases with increasing water depth, i.e., nearshore areas feature the highest percentage of sand-sized grains, while deeper and further offshore areas exhibit a higher percentage of mud-sized particles. Along the ECC, gravel content generally decreases with distance from shore, i.e., lowest gravel content, less than 5%, is expected at the landfall, gradually increasing to approximately 18% at the boundary to the OWF area.

In the coastal and marine waters of the ECC, areas of patch reef occur, associated with the newly designated "Woodside Patch Reefs" and the "Twenty Fathom Shelf Reef" Victorian Marine Key Ecological Features (**MKEF**), as defined in DEECA's *Victoria's Framework for Identifying Marine Key Ecological Features* (2025). Two areas of littoral sand in State waters within the ECC are Victorian MKEFs: Woodside Ocean Beaches and Woodside Offshore Sediment Beds. Refer to Section 4.3.1 for more information on the designation of MKEFs.

4.2.3 COASTAL GEOLOGY AND MORPHOLOGY

The coastal geology of the Gippsland region between Wilsons Promontory and Golden Beach is defined by a complex interplay of ancient tectonic activity, sedimentary processes, and contemporary coastal dynamics (Kennedy et al. 2024).

Wilsons Promontory mainly comprises Middle Devonian granitic outcrops, particularly the Mount Singapore Granite, which forms headlands and elevated terrain shaped by faulting and deep weathering during the Mesozoic era. This granitic landscape transitions northward into the Gippsland Basin, which is a Mesozoic rift structure filled with up to 7.5 km of sediments, including carbonates from the Seaspray Group and volcaniclastic deposits from the Strzelecki Group (Kennedy et al. 2024).

Toward Golden Beach, the coastline is characterized by extensive Quaternary barrier systems, including the well-preserved Prior, Inner, and Outer Barriers, which formed during consecutive periods of elevated sea levels. Ninety Mile Beach, located on the seaward edge of the Outer Barrier, exemplifies a dynamic littoral sediment transport system, with longshore drift moving quartz-rich sands north-eastward from Corner Inlet. These barrier systems surround the estuarine areas such as the Gippsland Lakes, which are supported by Miocene to Pleistocene sediments (Kennedy et al. 2024).

The coast adjacent to the Referral Area includes the south-east facing shorelines of the Wellington Shire with Corner Inlet to the west. Based on a review of CoastKit information, the coastline is described as follows. The coast inshore and to the north of the Referral Area 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.

The Ninety Mile Beach coastline overlaps the Referral Area, which extends from Lakes Entrance in the north-east to McLoughlins Beach in the south-west. 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. Ninety Mile Beach Marine National Park, which extends along the coastline for approximately five kilometres, lies directly adjacent to the ECC.

The continuity of Ninety Mile Beach includes several river and wetland systems including Jack Smith Lake and Freshwater Swamp near Woodside Beach, which are located shoreward of the coastal dunes and adjacent to the ECC.

To the west, adjacent to the Referral Area 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. Corner Inlet is both a Ramsar-listed wetland and designated Marine and Coastal Park. Corner Inlet Ramsar Site (directly adjacent to Referral Area) is characterised by a network of coastal wetland types, including intertidal flats, sandy shores, intertidal marshes and forests, and subtidal aquatic beds (BMT WBM 2011). Corner Inlet Marine National Park (approximately 49 km south-west from the ECC) consists of sandy beaches and splits, gravelly intertidal reefs, solid subtidal reefs, saltmarsh, mangrove, seagrass and mudflat habitat (Barton et al. 2012).

To the south-west of the Referral Area lies Wilsons Promontory (approximately 50 km from the ECC), a protected region that includes Wilsons Promontory Marine National Park (approximately 65 km from the ECC), which protects the surrounding reef and kelp forests, and Wilsons Promontory National Park (approximately 46 km from the ECC), which covers the terrestrial portion. This area comprises the only rocky promontories in the vicinity of the Referral Area. The complex of rocky headlands that comprises Wilsons Promontory is interspersed with sandy beaches. The region is 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.

Gippsland Lakes Coastal Park is located approximately 8 km north-east of the ECC. This area consists of the protected Gippsland Lakes Ramsar Site (approximately 8 km north-east of the ECC), characterised by a variety of wetland habitat, including coastal lagoons, marshes and freshwater swamps. The coastal morphology of the Gippsland Lakes Coastal Park is comprised of beaches, sand dunes, fluvial and tidal deltas and estuarine systems. Additionally, the Park contains Australia’s largest active barrier system, the Ninety-Mile Beach barrier system, with the Gippsland Lakes having formed within depressions between three barrier sequences (Kennedy et al, 2024). These three distinct groups of sand ridges were configured by wave action at differing sea levels during the Pleistocene and Holocene, resulting in diverse and complex morphology.

4.2.4 COASTAL ACID SULFATE SOILS

Coastal acid sulfate soils (**CASS**) are naturally formed soils, sediments, and peats that contain iron sulfides, mainly in the form of pyrite (Sammut et al, 1996). These soils are typically found in estuarine and river environments, as well as in low-lying coastal areas. CASS occurs naturally along many parts of Victoria's coastal zone and extends into some intertidal areas, such as the intertidal areas of the Referral Area. Disturbance of potential CASS (**P-CASS**) may result in acidification of water and soil, which can lead to significant impacts to the surrounding ecology.

Spatial data published online by Agriculture Victoria (Rampant et al. 2003), shows areas of P-CASS identified along the boundary of the ECC include wetland areas along the entire coastline inshore of the Referral Area (Figure 4-3).Key locations of potential CASS in proximity to the Referral Area include:

- Corner Inlet (approximately 54 km west of the Referral Area)
- Port Albert (approximately 23 km south-west of the Referral Area)
- Shoal Inlet (approximately 12 km south-west of the Referral Area)
- Freshwater Swamp (approximately 0.5 km north-west of the Referral Area)
- Mcloughlins Beach Coastal Reserve (directly adjacent to the Referral Area)
- Jack Smith Lake (approximately 0.2 km outside of the Referral Area).

Areas of P-CASS may extend to the shoreline and coastal sediments, subject to tidal influences. Further investigations would be required at the chosen export cable route to determine the presence of CASS and assess the risks associated with sediment disturbance.

4.2.5 OCEANOGRAPHY

Currents within Bass Strait vary seasonally and are mainly driven by tides, wind, incident continental shelf waves and density driven flows, which lead to the formation of sea level anomalies and pressure gradients at either end of the strait. The summer current system prevails for approximately a third of the year formed from mean southerly winds. For the remainder of the year, westerly winds cause predominantly eastwards flows with variations around islands and localised morphological features. Several current systems prevail within, and in the vicinity of, Bass Strait. The nearshore and offshore areas of the Referral Area are affected by the warmer and saltier waters of the South Australian Current (**SAC**), the EAC and sub-Antarctic Surface Water (**SASW**). The tides exhibit a daily pattern, and sea temperatures range from 13°C in winter to 17–18°C in summer (WSP, 2023a).

Due to significant changes in air temperature and freshwater inflow, the water column stratification also varies seasonally. During summer, the vertically mixed layer is limited to the warmer upper 30 m to 40 m of the water column, while in winter cold air temperatures promote ongoing vertical water flow and a well-mixed water column for approximately 6 months.

Detailed oceanographic conditions derived from modelled scenarios have provided a preliminary insight into anticipated conditions at the Referral Area. Modelled outputs indicate sea state conditions experience large monthly fluctuations in significant wave height, where extreme weather conditions have also been considered. Salinity at the wind farm site shows a well-mixed water column with no halocline, demonstrated by an average salinity of 35.60 practical salinity units (**PSU**) over the complete profile, surface and at depth. Depth-averaged current velocity ranged from 1.0 m/s over a 1-year return period to 1.75 m/s over a 100-year return period. Surface current velocity ranged from 1.41 m/s over a 1-year return period to 1.32 m/s over a 100-year return period. Combined diurnal and semi-diurnal tidal levels in the Referral Area range from -1.04 m at the Lowest Astronomical Tide (**LAT**) and 0.82 m at the Highest Astronomical Tide (**HAT**).

Ninety Mile Beach
The Honeysuckles
Seaspray
Giffard
Woodside
Woodside Beach
Yarram
Port Albert

Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- Commonwealth / State Waters Boundary

Potential Coastal Acid Sulfate Soils (P-CASS)

- Made land
- Prospective
- Water

Coordinate System:
GDA 1994 MGA Zone 55
Date: 07/10/2025
Created By: HD
Drawing Size: A3
0 5 10km
1:300,000

F4-3 - Potential Coastal Acid Sulfate Soils

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-002-V2.4

Source:
Base Data: VicMap

4.3 ECOLOGICAL ENVIRONMENT

4.3.1 HABITATS AND BIOLOGICAL COMMUNITIES

Habitats and biological communities within and adjacent to the Referral Area, are described in Table 4-1. Generally, the Referral Area is comprised of calcareous gravel, sand, and silt with no overlapping Commonwealth-designated Key Ecological Features (**KEFs**). Benthic, planktonic communities within the Referral Area are expected to be representative of the SEMR. Pelagic and demersal fish populations within the Referral Area are expected to be representative of the Southeast Shelf Transition within the SEMR. Coral, mangrove, seagrass and macroalgae communities are not mapped within the Referral Area, however, seagrass meadows, kelp forests and macroalgae communities occur along the Victorian coastline to the east and west of the Referral Area. Saltmarsh is the dominant habitat type in intertidal areas.

It is noted that the data around habitats and biological communities in the Referral Area is sparse, and more site-specific information would facilitate a robust and transparent environmental assessment. As such, surveys would be undertaken to characterise habitats and biological communities in the Referral Area.

In late 2025 DEECA released its Marine Key Ecological Features Framework. It provides a scientifically robust and spatially explicit method for identifying and prioritising ecologically significant marine areas within and adjoining Victorian waters. The framework is intended to replace earlier biodiversity information such as the 2010 Marine Asset Layer (**MAL**).

MKEFs are graded into a three-tier system commensurate with their ecological significance:

- Tier 1- Flagship: Features of exceptional ecological significance
- Tier 2- Highly Significant: Features of high ecological significance
- Tier 3- Significant: Features meet significance criteria, important for biodiversity and/or ecosystem processes

While the designation of MKEFs does not confer statutory protection, many MKEFs overlap with areas that are protected under legislation such as the *National Parks Act 1975*. The intent of MKEFs is to help identify areas where development should be avoided, minimised, or carefully managed to reduce conflict with biodiversity objectives.

The Referral Area does not overlap with any Tier 1 or Tier 2 MKEFs (see Figure 4-15). It overlaps with four Tier 3 MKEFs, as listed below and discussed in Table 4-1:

- Woodside Patch Reefs MKEF
- Twenty Fathom Shelf Reef MKEF
- Woodside Ocean Beaches MKEF
- Woodside Offshore Sediment Bed MKEF.

TABLE 4-1 SUMMARY OF HABITATS AND BIOLOGICAL COMMUNITIES

Habitat/ Community	Description
Sediment	The intertidal regions of the Referral Area consist of mixed soft substrata, fine sediments and silt. The nearshore region of the ECC comprises predominantly sublittoral sand and muddy sand and the sediment in OWF area comprises predominantly of calcareous gravel, sand, and silt. Sediment in the further extents of the Referral Area are not accurately mapped to allow for distinct sediment types to be described, however, is expected to be representative of the broader SEMR, comprises predominantly of calcareous gravel, sand, and silt (Seamap Australia 2023). Two areas of littoral sand in State waters within the ECC are DEECA Victorian-designated MKEFs: Woodside Ocean Beaches, and Woodside Offshore Sediment Bed. Woodside Ocean Beaches are considered notable shorebird habitat and are associated with protected species such as Hooded Plover, Great Knot, Curlew Sandpiper, Red Knot and other migratory birds. The Woodside Offshore Sediment Bed is associated with high diversity infauna in offshore sediments that are typical of wider shelf communities.
Infralittoral rock	The ECC overlaps with areas of low profile reef, which forms part of the Victorian-designated Woodside Patch Reefs MKEF. The MKEF is offshore from Ninety Mile Beach, between Mcloughlins Beach and Seaspray. The north-eastern ECC overlaps with the Twenty Fathom Shelf Reef MKEF offshore from Ninety Mile Beach, between Mcloughlins Beach and Marlo. The Woodside Patch Reefs MKEF area comprises sessile invertebrates and filter feeding assemblages. Reefs are stepping-stone habitats for snapper, white shark and possible grey nurse sharks. The Twenty Fathom Shelf Reef MKEF is considered to support diverse sessile invertebrate biotopes and fish aggregations, being a stepping stone habitat for fish and crustacean migrations along the Gippsland shelf, including snapper, white shark, gummy shark.
Banks and Shoals	Banks and shoals are a significant habitat within the SEMR. No banks or shoals were identified in or in proximity to, the Referral Area. The closest bank/shoal is located approximately 220 km south-west of the OWF area.

Habitat/ Community	Description

Protected Areas	Legally protected areas, including key features overlapping or within 5 km of the offshore components of the Referral Area include:
	• Ninety Mile Beach Marine National Park (directly adjacent to the ECC)
	  ◦ intertidal and extensive subtidal soft sediment habitats
	  ◦ nursery and transient habitat for shark, marine mammal and shore and seabird species
	• Nooramunga Marine and Coastal Park (directly adjacent to the ECC)
	  ◦ sheltered, shallow waters, unique intertidal mudflats, extensive seagrass meadows, and barrier islands
	• Jack Smith Lake W.R Natural Features Reserve (approximately 200 m outside of the ECC)
	  ◦ coastal lagoons, salt marshes and native grasslands
	  ◦ feeding and nesting habitat for a range of waterbirds
	• Lake Denison W.R Natural Features Reserve (approximately 3 km north-east of the ECC)
	  ◦ Natural features
	• Fresh-water Swamp, Woodside Beach W.R Natural Features Reserves (approximately 500 m north-west of the ECC)
	  ◦ Natural features
	• Darriman H29 B.R Natural Features Reserve (approximately 3 km north-west of the ECC)
	  ◦ Natural features

Habitat/ Community	Description
Key Ecological Features	There are no Commonwealth-designated KEFs overlapping the Referral Area. The nearest Commonwealth-designated KEFs are as follows: • The upwelling east of Eden is an area of high productivity and aggregations of marine life and is located approximately 60 km north-east of the OWF area. • Big Horseshoe Canyon is an area of high productivity and aggregations of marine life and is located approximately 155 km east of the OWF area. As described above, there are four Victorian-designated MKEF overlapping the Referral Area: • Woodside Ocean Beaches (Tier 3 – Significant) • Woodside Patch Reefs (Tier 3 – Significant) • Woodside Offshore Sediment Bed (Tier 3 – Significant) • Twenty Fathom Shelf Reef (Tier 3 – Significant) A number of additional Victorian-designated MKEFs are located in the vicinity of the Referral Area. These are associated with the Corner Inlet Ramsar site and include: • Nooramunga Channels (Tier 3 – Significant; Channels with tide streams supporting *Posidonia* seagrass and sandy bed habitats). • Nooramunga Upper Sand Banks and Seagrass (Tier 3 – Significant; Significant shore and wetland bird populations feeding and roosting on upper littoral sediments). • Nooramunga Wetland Islands (Tier 3 – Significant; Wetland islands consisting of mangroves and saltmarsh vegetation. The islands influence hydrodynamic processes and provide habitat for wetland birds). • Clonmel Ocean Beaches and Entrance (Tier 3 – Significant; Shorebird habitat including seabird roosts). • Nooramunga Lower Sand and Seagrass Beds (Tier 1 – Flagship; Sediment banks on the sides of tidal channels supporting seagrass beds and sediment beds. Feeding grounds for wetland and migratory shore birds). Considering separation and nearshore and onshore activities, direct Project impacts to MKEFs adjacent to the Referral Area are considered unlikely. Further reference has been provided in Section 5.1.5.
Temperate coral	The Referral Area is located in temperate waters in depths ranging from the High Water Mark (**HWM**) to approximately 60 m. Temperate and deep-water (>50 m) corals are found throughout the Bass Straight predominantly along steep ridge lines and across pinnacles of underwater seamounts where currents are intensified, inhibiting the buildup of sediment and offering an ideal habitat (Commonwealth of Australia 2015). Soft corals are more common with hard (Scleractinian) corals occurring in more isolation. The desktop review of modelled marine benthic habitat likelihoods for temperate reef occurrence (see - Monk et all 2024) identified a probability of functional reef systems occurring across the Referral Area. The geomorphology of the Referral Area is largely characterised by a flat continental shelf, however, the furthest offshore boundary of the OWF area resides on the edge of a deepwater valley where deep water corals may occur.

Habitat/ Community	Description
Macroalgae	Macroalgae is not mapped within the Referral Area (Lucieer et al 2025). The closest mapped macroalgae habitat to the Referral Area is: • Coastal waters off Venus Bay (approximately 106 km west of the Referral Area) • North-Western waters of Port Phillip Bay (approximately 200 km north-west of the Referral Area) Available data of detailed benthic habitats in the Referral Area is scarce or non-existent. Although macroalgae is not present in mapped databases of benthic habitats within the Referral Area, there is the potential for macroalgae communities to exist within the ECC and OWF area, where hard substrate exists. Giant kelp forests are not mapped in the Referral Area. The closest habitat that may potentially support Giant Kelp forests is within Wilsons Promontory Marine National Park, 65 km south-west from the OWF area.
Seagrass meadows	The Referral Area does not overlap areas of mapped seagrass (Lucieer et al 2025). Seagrass habitats are present in several locations within proximity to the Referral Area extending throughout the shallow marine regions from Corner Inlet to McLoughlins Beach to the west and Loch Sport to Lake Tyres Beach in the east. The nearest seagrass meadow is located north of Dream Island, approximately 9 km south-west of the ECC. Seagrass Meadow is classified as Ecological Vegetation Class (**EVC**) 845 and described as abundant in sheltered marine shallows, intertidal flats and lower estuarine habitats with a scattered presence along the Victorian coastline. Dense seagrass meadows can be found in Corner Inlets and Port Phillip Heads Marine National Park (**MNP**) where seagrass meadows are protected. Seagrass species listed as endangered and protected in Victorian coastal waters under the *Flora and Fauna Guarantee Act 1988* (**FFG Act**) include; • *Posidonia australis* (fibre-ball weed) • *Althenia marina* (sea water-mat) • *Heterozostera nigricaulis* (Australian grass wrack), and • *Heterozostera tasmanic*a (Tasmanian grass wrack).
Mangrove	The Referral Area does not overlap areas of mapped mangrove. Mangroves are confined to shoreline habitats, in nearshore areas of the SEMR and can be found throughout the intertidal areas between Corner Inlet to McLoughlins Beach. The nearest mangrove forest is located in the intertidal areas throughout Nooramunga Marine and Coastal Park, approximately 1 km south-west of the Referral Area.

Habitat/ Community	Description
Saltmarsh and other intertidal marine flora	Saltmarsh habitats are characterised by low lying salt tolerant grasses, sedges and herbs in the tidal mudflats of estuaries and coastal lagoons. They provide extensive ecosystem services and act as a source of hydrodynamic buffering to support the structure of coastal shorelines and reduce erosion from natural and anthropogenic influences. Coastal saltmarshes can be found throughout the intertidal regions of Victoria and dense patches are present throughout the intertidal regions of the Referral Area. Key locations of saltmarshes within and nearest to the Referral Area include: • Jack Smith Lake (adjacent to the onshore component of the ECC, approximately 5 km from of the offshore component of the ECC) • McLoughlins Beach Coastal Reserve (directly adjacent to the ECC) • Lake Reeve (approximately 10 km north-east of the ECC) • Intertidal flats surrounding St Margaret Island (approximately 6 km south-west of the ECC) • Lake Wellington (approximately 19 km north-east of the ECC) *Althenia marina* (sea water-mat) can be found in sparse populations within the intertidal areas of Victoria (ALA 2025). *Althenia marina* is listed as endangered and protected in Victorian coastal waters under the FFG Act. Specimens have been observed around Lake Reeve and Jack Smith Lake.
Plankton	Phytoplankton within the Referral Area is generally expected to reflect the conditions of the SEMR. The oceanography of the SEMR contributes to enhanced areas of primary productivity, including: • Spring and autumn phytoplankton blooms in the Subtropical Convergence Zone (south of Tasmania), as an area of high productivity, sustained by nutrient rich subantarctic waters in the summer months (Jitts 1965) • Primary productivity associated with the Bass Cascade and upwelling of cool nutrient-rich waters along the mainland coast north-east of Bass Strait (CoA 2015) • Localised seasonal upwellings along the Bonney Coast (CoA 2015), and • Increased abundance and productivity can occur in areas of upwelling e.g. Upwelling East of Eden Commonwealth-designated KEF. Each of these regions of productivity are associated with aggregations of pelagic marine life (Hosack & Dambacher 2012).
Pelagic and Demersal Fish Populations	Pelagic and demersal fish populations within the Referral Area are expected to be representative of the Southeast Shelf Transition within the SEMR, which includes species such as tiger flathead, bream, snapper, and Australian salmon (Commonwealth of Australia, 2015). The distribution of commercial fisheries that overlap or surround the Referral Area indicate that the area may also contain blue grenadier, ling, wrasse, scallop, octopus, Australian sardine, elephant fish, boarfish and several shark species (VFA, 2025). Threatened and migratory fish and shark species that may be found in the Referral Area are outlined in more detail in Section 4.3.3.1, and commercially targeted fish species are presented in Section 4.4.2.

Habitat/ Community	Description
Epifauna and Infauna	Filter feeders such as sponges, ascidians, soft corals, and gorgonians are animals that feed by actively filtering suspended matter and food particles from water by passing the water over specialised filtration structures (DEWHA 2008). Epifaunal and infaunal communities within the Referral Area are expected to be representative of the substrate types (sand, silt, mud and gravel) and consist of small crustacea, annelids, polychaetes, filter feeders, sponges and gorgonians (Heislers et al 2007).

4.3.2 BIOLOGICALLY IMPORTANT AREAS

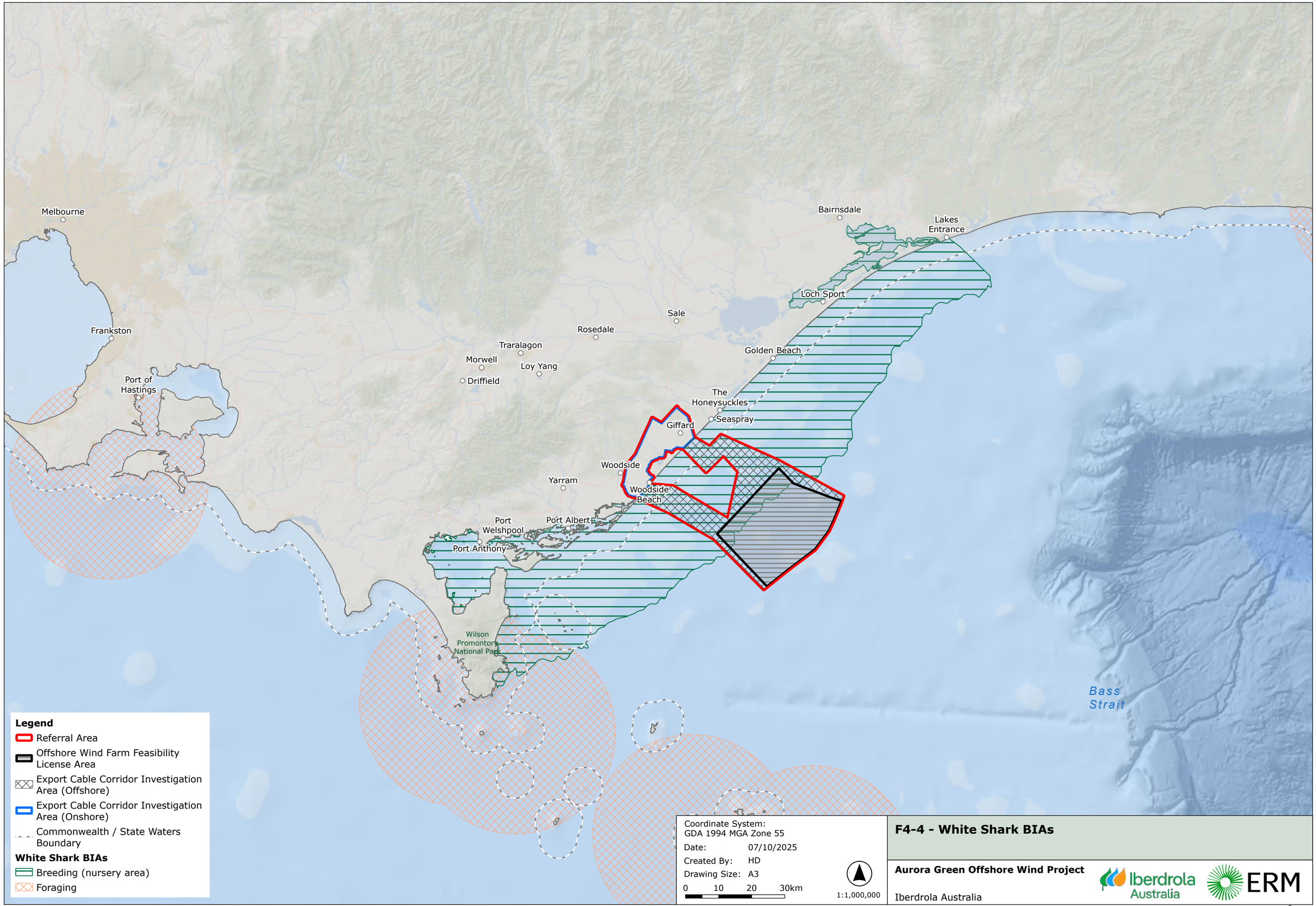
A BIA is indicative of an area with a high level of importance for species such as those listed as threatened or migratory under the EPBC Act. BIAs are fundamental for biologically important behaviour such as breeding, foraging, nesting and migration (DCCEEW 2021). BIAs that overlap the Referral Area are presented in

Table 4-2 and from Figure 4-4 to Figure 4-14. No additional BIAs occur within the 5 km buffer.

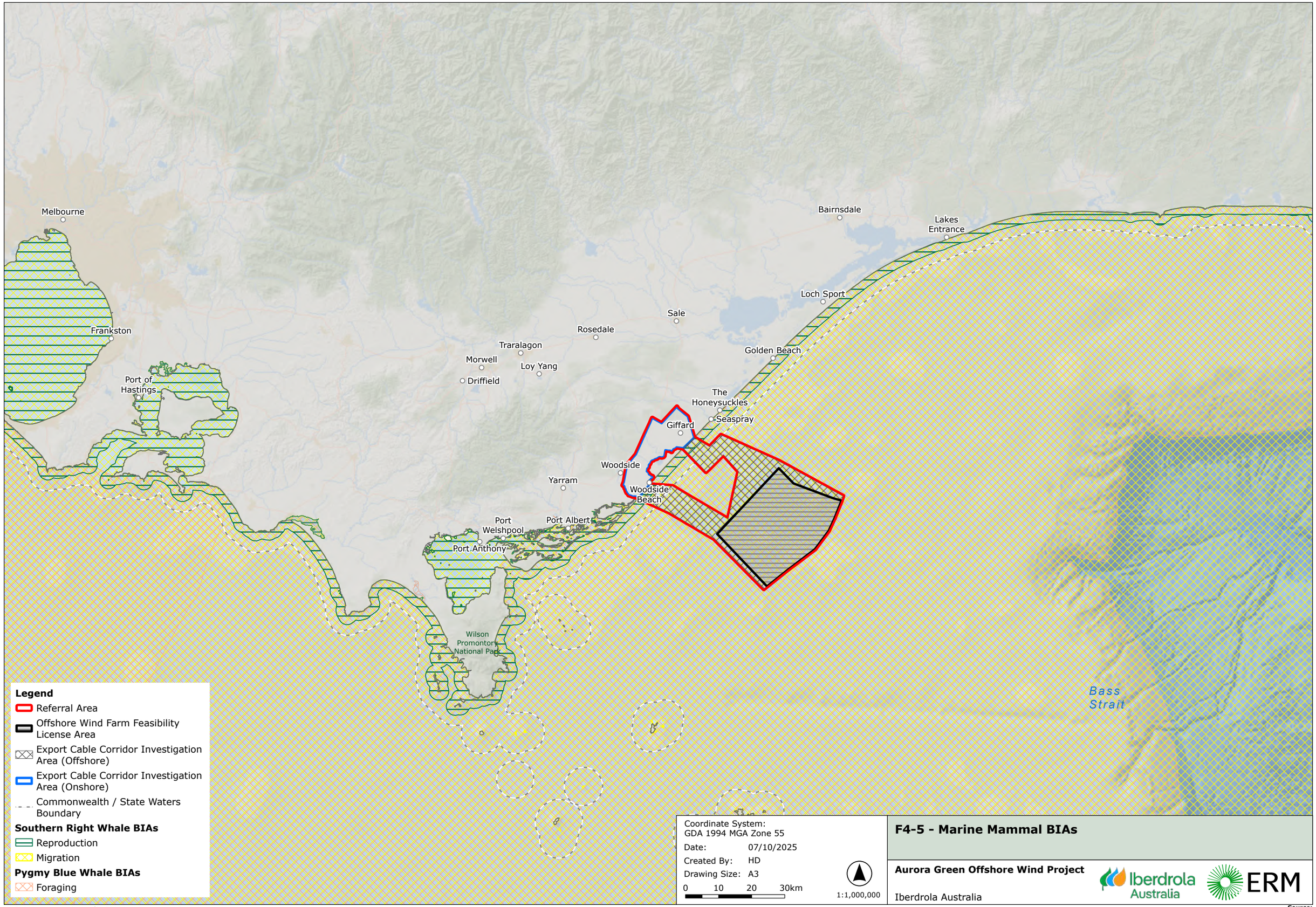
TABLE 4-2 SUMMARY OF BIOLOGICALLY IMPORTANT AREAS

Species	BIA Description	BIA Location	PMST Presence
Fish and Sharks			
White Shark	Breeding (nursery area)	Corner Inlet	Known to occur
Marine Mammals			
Southern Right Whale	Migration	All waters from Cape Leeuwin (WA) to Eden (NSW) out to the 200 nautical miles (**nm**) Commonwealth marine area boundary	Known to occur
	Reproduction	All State coastal waters out to 2.5 km from shore, including Tasmania	Known to occur
Pygmy Blue Whale	Foraging	The majority of Bass Strait and the coastal waters of Tasmania	Likely to be present
Seabirds and Migratory Shorebirds			
Black-browed Albatross	Foraging	The whole SEMR	Known to occur
Bullers Albatross	Foraging	Most of the SEMR	Known to occur
Campbell Albatross	Foraging	The whole SEMR including Macquarie Island	Known to occur
Common Diving-petrel	Foraging	Buffer around Tasmania and Victoria	Known to occur
Indian Yellow-nosed Albatross	Foraging	Most of the SEMR	Known to occur

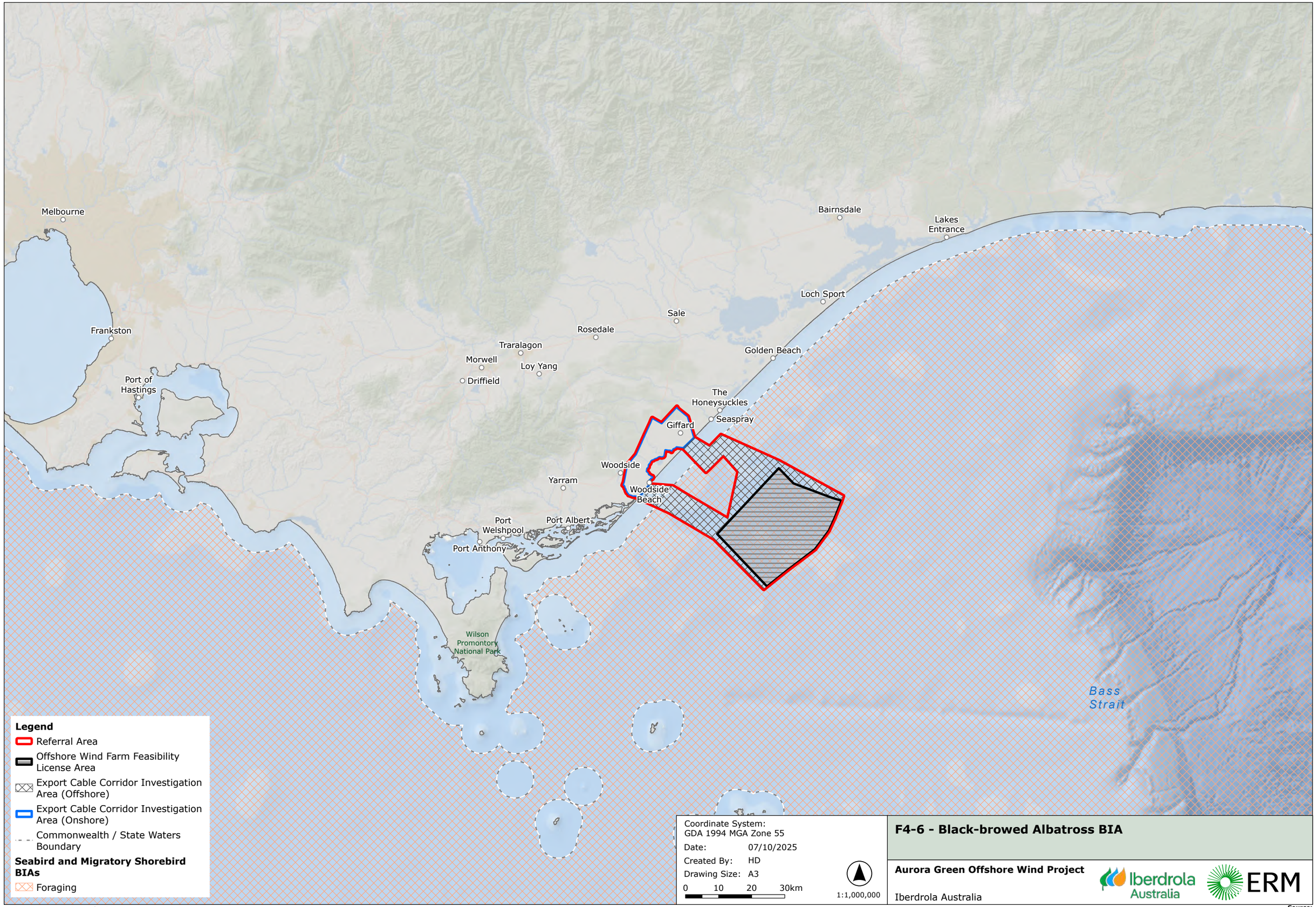
Species	BIA Description	BIA Location	PMST Presence
Short-tailed Shearwater	Foraging	Buffer around Tasmania including Bass Strait	Known to occur
Shy Albatross	Foraging likely	The whole SEMR	Likely to occur
Wandering Albatross	Foraging	The whole SEMR	Known to occur
White-faced Storm-petrel	Foraging	Buffer around the northern side of Tasmania into Bass Strait	Known to occur



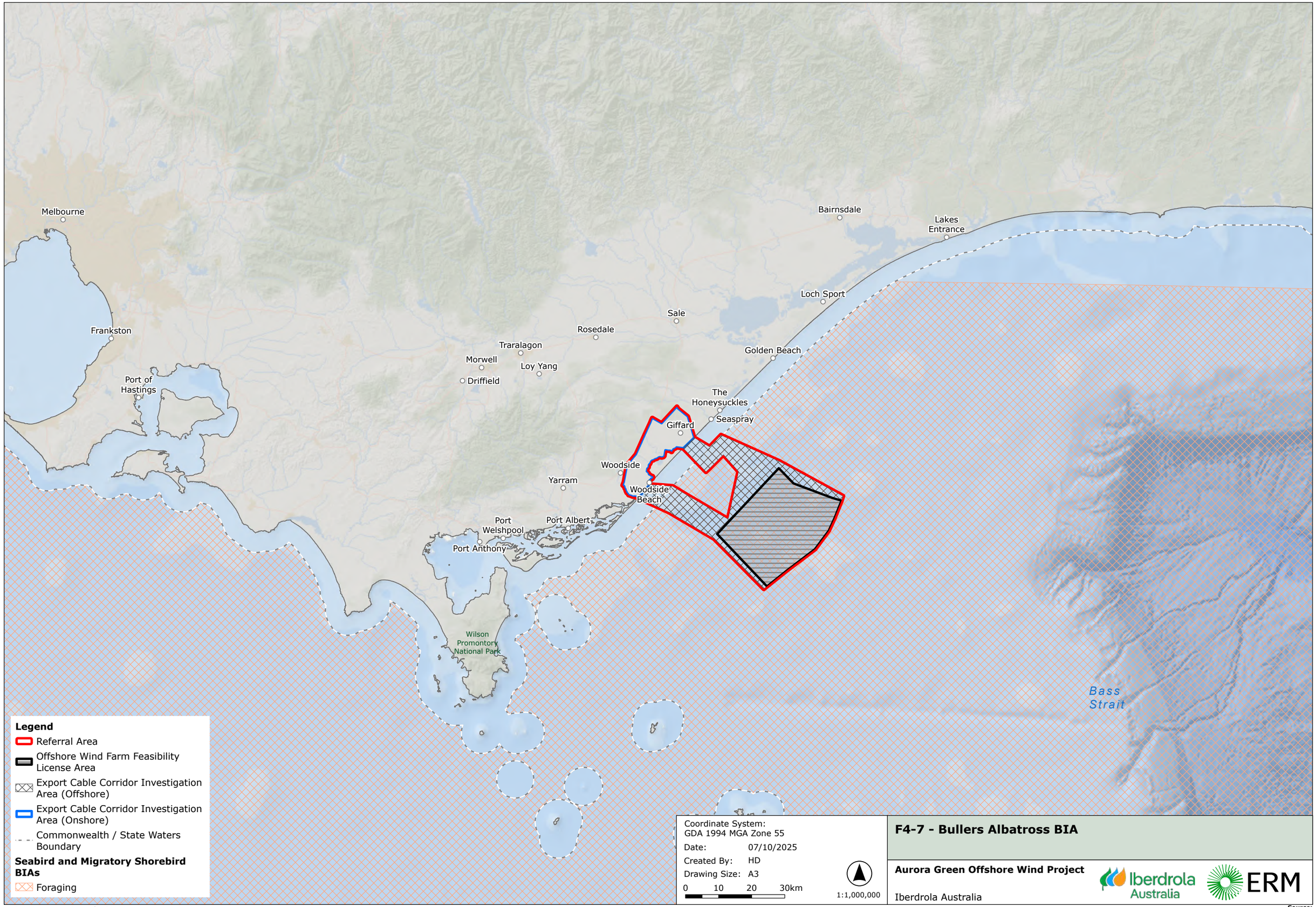
0758202_PMAR_R6.aprx/0758202-FIG-PMAR-004-V2.3



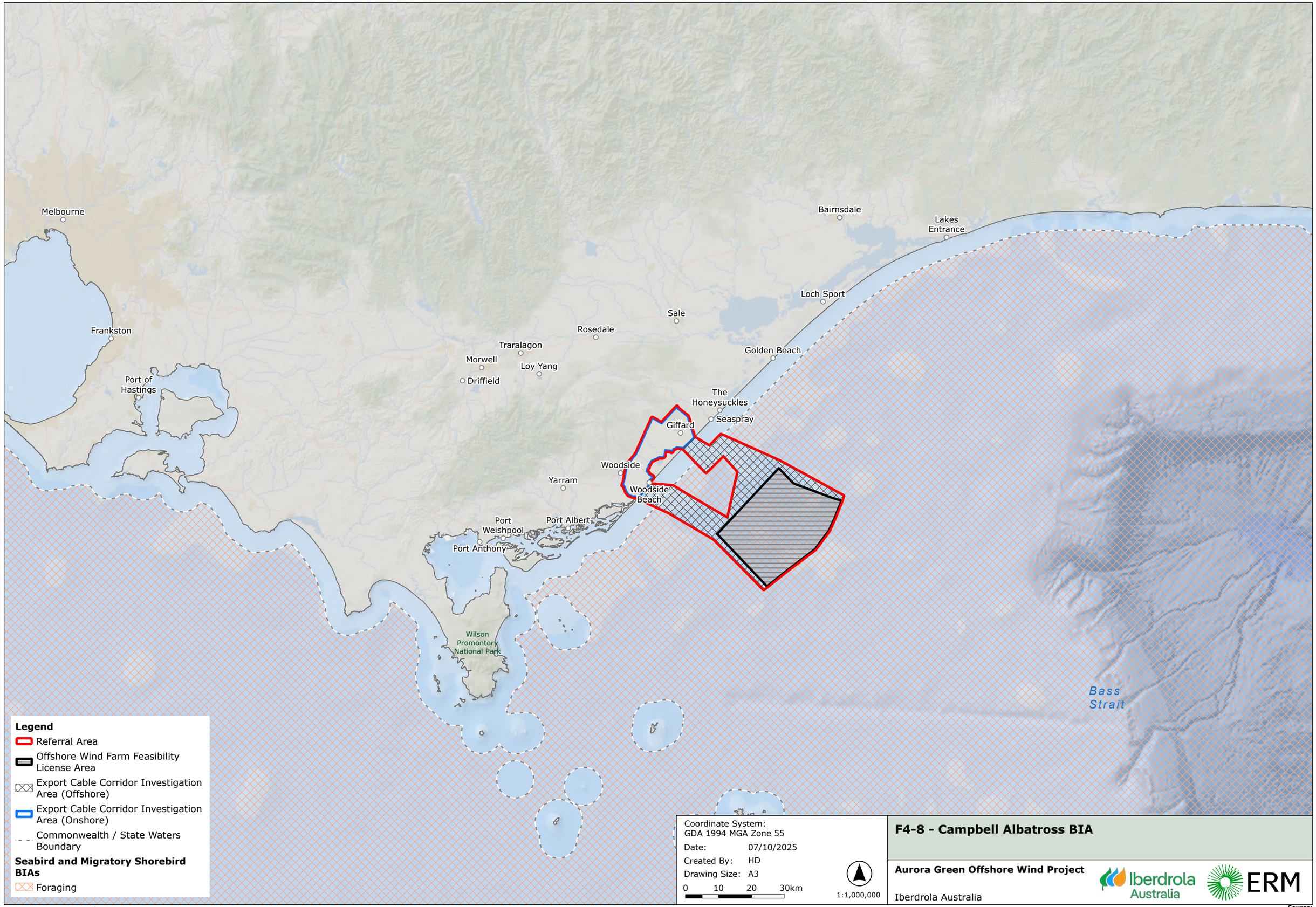
0758202_PMAR_R6.aprx/0758202-FIG-PMAR-005-V2.3



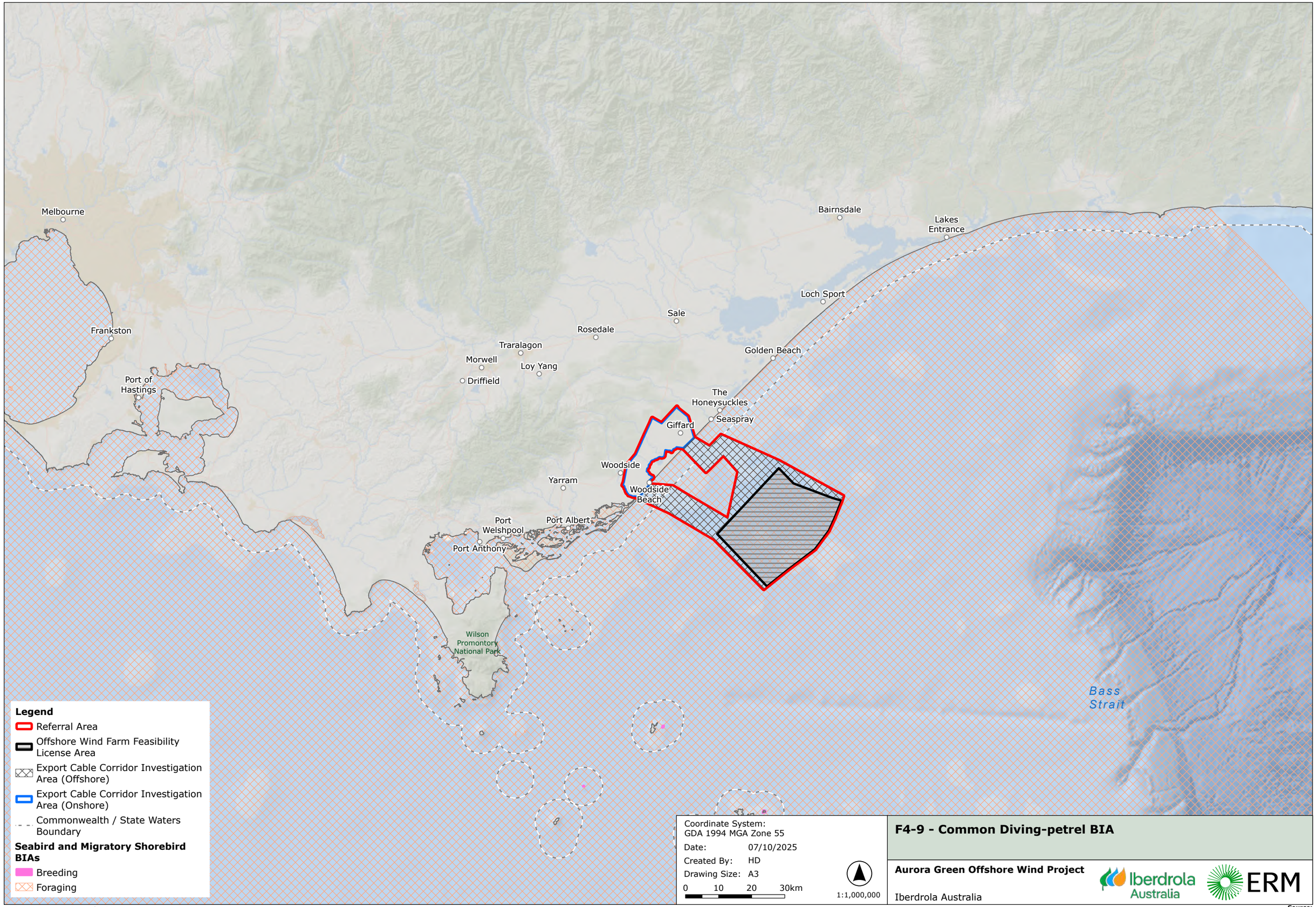
0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3



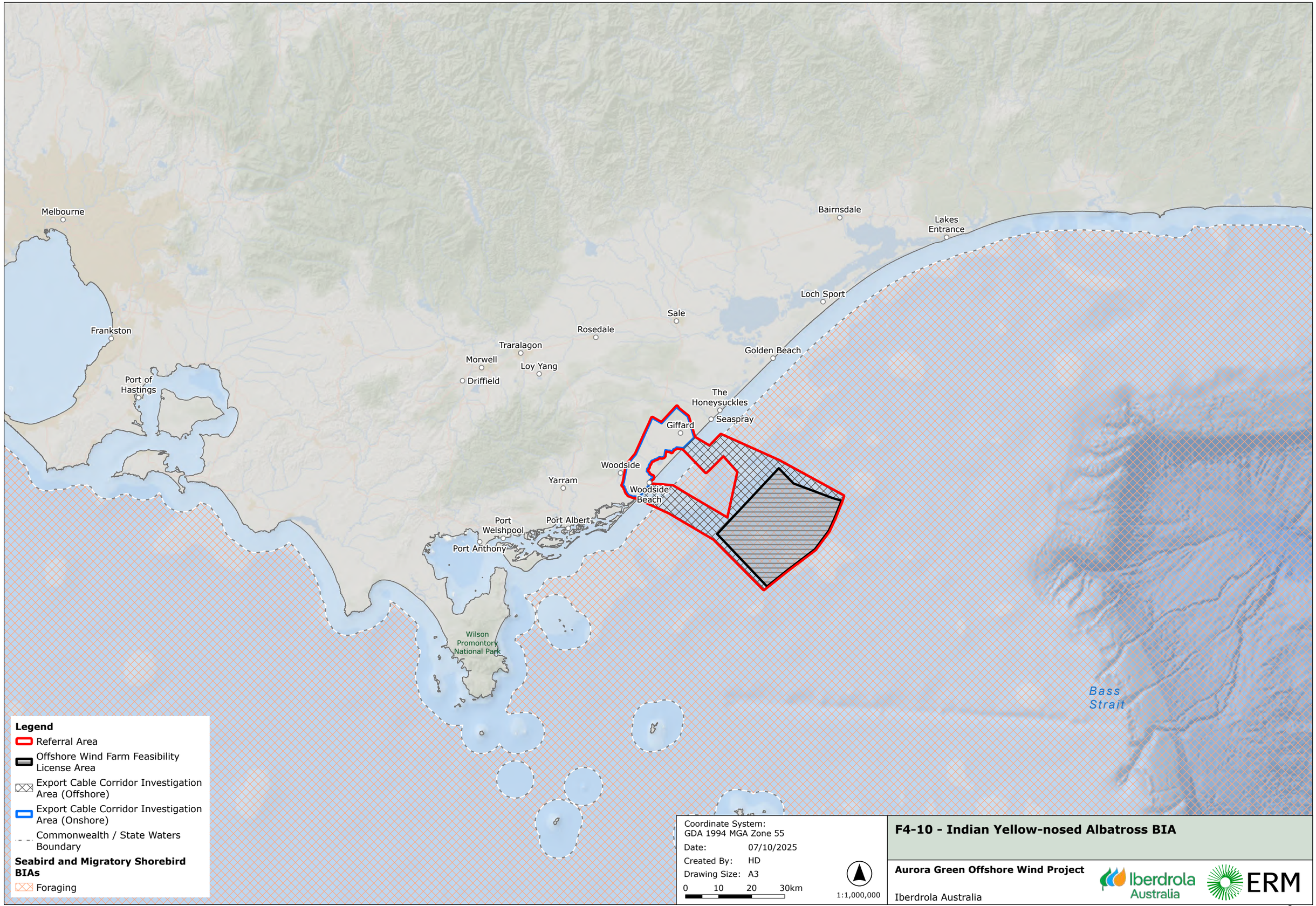
0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3



0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3



0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3



0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3

Melbourne
Frankston
Port of Hastings
Traralagon
Morwell
Loy Yang
Driffield
Rosedale
Sale
Bairnsdale
Lakes Entrance
Loch Sport
Golden Beach
The Honeysuckles
Seaspray
Giffard
Woodside
Yarram
Woodside Beach
Port Welshpool
Port Albert
Port Anthony
Wilson Promontory National Park
Bass Strait

Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- Commonwealth / State Waters Boundary

Seabird and Migratory Shorebird BIAs

- Breeding
- Foraging

Coordinate System:
GDA 1994 MGA Zone 55
Date: 07/10/2025
Created By: HD
Drawing Size: A3
0 10 20 30km
1:1,000,000

F4-11 - Short-tailed Shearwater BIA

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3

Source:
Base Data: VicMap

Melbourne
Frankston
Port of Hastings
Morwell
Traralagon
Loy Yang
Driffield
Rosedale
Sale
Bairnsdale
Lakes Entrance
Loch Sport
Golden Beach
The Honeysuckles
Seaspray
Giffard
Woodside
Yarram
Woodside Beach
Port Welshpool
Port Albert
Port Anthony
Wilson Promontory National Park
Bass Strait

Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- Commonwealth / State Waters Boundary

Seabird and Migratory Shorebird BIAs

- Foraging

Coordinate System:
GDA 1994 MGA Zone 55

Date: 07/10/2025
Created By: HD
Drawing Size: A3

0 10 20 30km

1:1,000,000

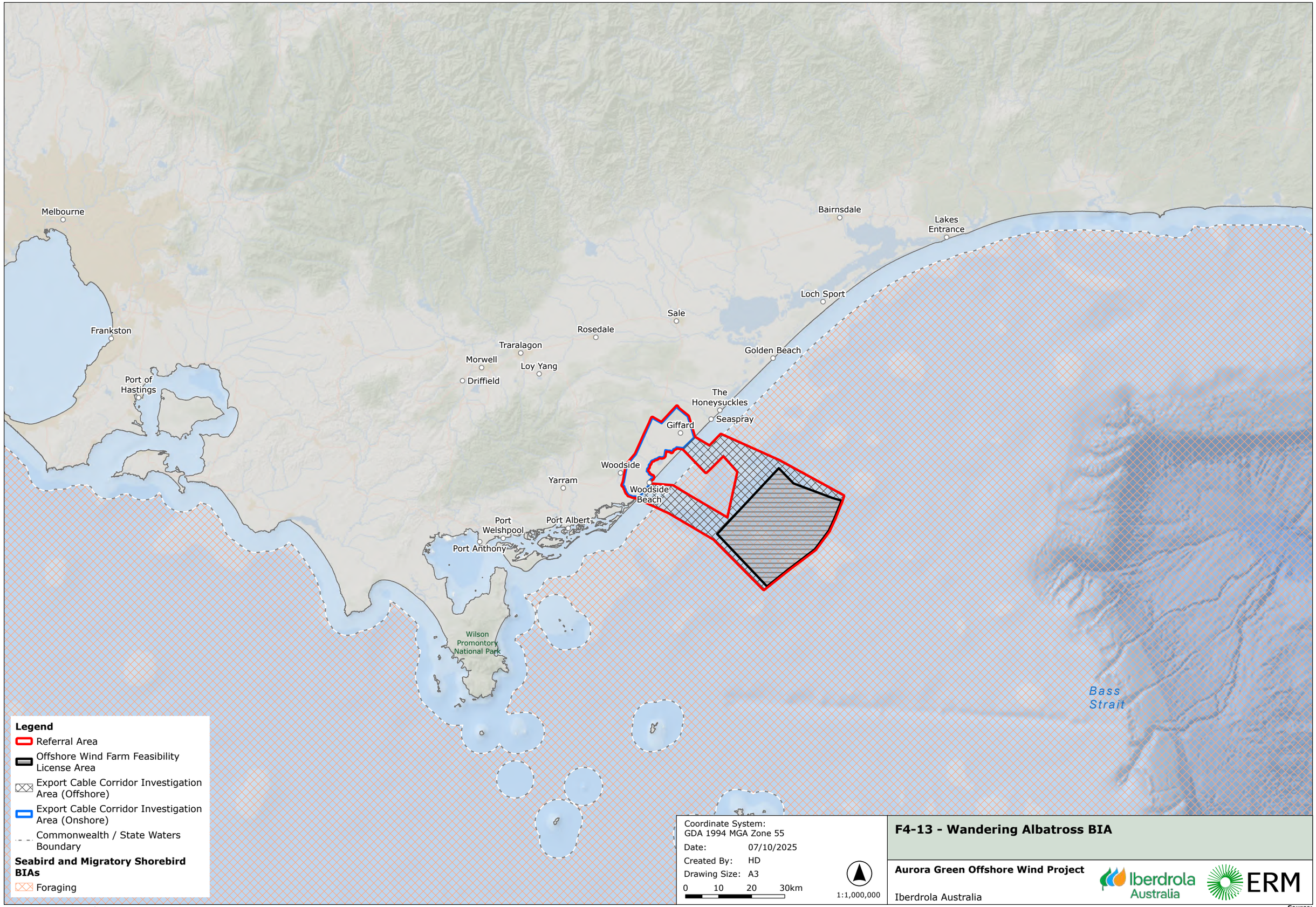
F4-12 - Shy Albatross BIA

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3

Source:
Base Data: VicMap



0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3

Melbourne
Frankston
Port of Hastings
Morwell
Traralagon
Loy Yang
Driffield
Rosedale
Sale
Bairnsdale
Lakes Entrance
Loch Sport
Golden Beach
The Honeysuckles
Seaspray
Giffard
Woodside
Yarram
Woodside Beach
Port Welshpool
Port Albert
Port Anthony
Wilson Promontory National Park
Bass Strait

Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- Commonwealth / State Waters Boundary

Seabird and Migratory Shorebird BIAs

- Breeding
- Foraging

Coordinate System:
GDA 1994 MGA Zone 55
Date: 07/10/2025
Created By: HD
Drawing Size: A3
0 10 20 30km
1:1,000,000

F4-14 - White-faced Storm-petrel BIA

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-006-V2.3

Source:
Base Data: VicMap

4.3.3 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Table 4-3 summarises the MNES overlapping the Referral Area, inclusive of a 5 km buffer.

TABLE 4-3 SUMMARY OF MNES

MNES	Number of MNES in Referral Area (including 5 km buffer)
World Heritage Properties	0
National Heritage Places	0
Wetlands of International Importance (Ramsar)	1
Commonwealth Marine Area	N/A
Listed Threatened Ecological Communities	1
Listed Threatened Species*	55
Listed Migratory Species*	72

*Terrestrial and freshwater species have not been included.

4.3.3.1 THREATENED AND MIGRATORY SPECIES

A total of 83 EPBC Act listed species considered to be MNES and relevant to the marine environment were identified as potentially occurring within the ECC and OWF area. Two conservation dependent species were identified with a potential to occur within the Referral Area, the school shark (*Galeorhinus galeus)* and blue warehou (*Seriolella brama*), which are not classified as MNES. Threatened and migratory species identified as potentially occurring within the Referral Area are listed in Table 4-4.

A total of 49 FFG Act listed threatened species have been identified from both the VBA and the PMST searches (Appendix A). Table 4-4 identifies the relevant FFG Act listed threatened species that potentially occur within the offshore component of the ECC and OWF area.

The full list of marine species identified from the PMST searches is provided in Appendix A. Terrestrial MNES and FFG Act listed species excluded in this marine assessment are addressed in the *Aurora Green Offshore Wind Project: Preliminary Terrestrial Ecological Assessment Report* (ERM, 2025b).

TABLE 4-4 EPBC ACT AND FFG ACT LISTED THREATENED AND MIGRATORY SPECIES

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Fish and Sharks						
Carcharias taurus	Grey Nurse Shark	N/A[2]	Migratory	Marine	Species or species habitat may occur within area	Critically Endangered*
Carcharodon carcharias	White Shark	Vulnerable	Migratory	Marine	Breeding known to occur within area	Endangered*
Galeorhinus galeus	School Shark	Conservation Dependent	N/A	Marine	Species or species habitat likely to occur within area	N/A
Isurus oxyrinchus	Shortfin Mako	N/A	Migratory	Marine	Species or species habitat likely to occur within area	N/A
Lamna nasus	Porbeagle	N/A	Migratory	Marine	Species or species habitat likely to occur within area	N/A
Rhincodon typus	Whale Shark	Vulnerable	Migratory	Marine	Species or species habitat may occur within area	N/A
Seriolella brama	Blue Warehou	Conservation Dependent	N/A	N/A	Species or species habitat known to occur within area	Conservation Dependent*
Prototroctes maraena	Australian Grayling	Vulnerable	N/A	N/A	Species or species habitat known to occur within area	Endangered*

[1] '*' denotes species as FFG Act Threatened status, but not recorded in the VBA results.
[2] Not listed as Threatened at species level, but east and west coast subpopulations are listed as critically endangered and vulnerable, respectively. However, the Referral area does not overlap the distribution of either population and the species is uncommon in Victorian waters.

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Marine Mammals						
Arctophoca forsteri	Long-nosed Fur Seal	N/A	N/A	Marine	Species or species habitat may occur within area	Vulnerable
Balaenoptera borealis	Sei Whale	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Balaenoptera musculus	Blue Whale	Endangered	Migratory	Marine	Species or species habitat likely to occur within area	Endangered*
Balaenoptera physalus	Fin Whale	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Caperea marginata	Pygmy Right Whale	N/A	Migratory	Marine	Foraging, feeding or related behaviour may occur within area	N/A
Eubalaena australis	Southern Right Whale	Endangered	Migratory (as *Balaena glacialis australis*)	Marine	Species or species habitat known to occur within area	Endangered
Lagenorhynchus obscurus	Dusky Dolphin	N/A	Migratory	Marine	Species or species habitat may occur within area	N/A
Megaptera novaeangliae	Humpback Whale	N/A	Migratory	Marine	Species or species habitat known to occur within area	Critically Endangered (*as Megaptera novaeangliae australis*)

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Orcinus orca	Killer Whale	N/A	Migratory	Marine	Species or species habitat likely to occur within area	N/A
Marine Turtles						
Caretta caretta	Loggerhead Turtle	Endangered	Migratory	Marine	Species or species habitat known to occur within area	N/A
Chelonia mydas	Green Turtle	Vulnerable	Migratory	Marine	Species or species habitat may occur within area	N/A
Dermochelys coriacea	Leatherback Turtle	Endangered	Migratory	Marine	Foraging, feeding or related behaviour known to occur within area	Critically Endangered*
Land Birds						
Accipiter novaehollandia	Grey Goshawk	N/A	N/A	N/A	N/A	Endangered
Heliaeetus leucogaster	White-bellied Sea-eagle	N/A	Migratory	Marine	N/A	Endangered
Neophema chrysogaster	Orange-bellied Parrot	Critically Endangered	N/A	Listed - overfly marine area	Species or species habitat known to occur within area	Critically Endangered
Lathamus discolor	Swift Parrot	Critically Endangered	N/A	Listed - overfly marine area	Species or species habitat known to occur within area	Critically Endangered
Pandion haliaetus	Osprey	N/A	Migratory	Marine	Species or species habitat known to occur within area	N/A

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Apus pacificus	Fork-tailed Swift	N/A	Migratory	Listed - overfly marine area	Species or species habitat likely to occur within area	N/A
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	N/A	Listed - overfly marine area	Species or species habitat known to occur within area	N/A
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	Vulnerable*
Motacilla flava	Yellow Wagtail	N/A	Migratory	Listed - overfly marine area	Species or species habitat may occur within area	N/A
Shorebirds						
Actitis hypoleucos	Common Sandpiper	N/A	Migratory	Marine	Species or species habitat known to occur within area	Vulnerable
Botaurus poiciloptilus	Australasian Bittern	Endangered	N/A	N/A	Species or species habitat likely to occur within area	Critically Endangered
Rostratula australis	Australian Painted Snipe	Endangered	N/A	Listed – overfly marine area (as *Rostratula benghalensis* (sensu lato))	Species or species habitat likely to occur within area	Critically Endangered
Gallinago megala	Swinhoe's Snipe	N/A	Migratory	Listed - overfly marine area	Roosting likely to occur within area	N/A
Gallinago stenura	Pin-tailed Snipe	N/A	Migratory	Listed - overfly marine area	Roosting likely to occur within area	N/A

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Thinornis cucullatus cucullatus	Eastern Hooded Plover	Vulnerable	N/A	Listed - overfly marine area	Species or species habitat known to occur within area	Vulnerable
Limosa lapponica baueri	Nunivak Bar-tailed Godwit	Endangered	N/A	N/A	Species or species habitat may occur within area	N/A
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable	Migratory	Marine	Roosting known to occur within area	N/A
Limosa lapponica	Bar-tailed Godwit	N/A	Migratory	Marine	Species or species habitat known to occur within area	Vulnerable
Limosa limosa	Black-tailed Godwit	Endangered	Migratory	Listed - overfly marine area	Roosting known to occur within area	Critically Endangered
Tringa nebularia	Common Greenshank	Endangered	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	Endangered
Calidris tenuirostris	Great Knot	Vulnerable	Migratory	Listed - overfly marine area	Roosting known to occur within area	Critically Endangered
Calidris canutus	Red Knot	Vulnerable	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	Endangered
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	Critically Endangered
Calidris melanotos	Pectoral Sandpiper	N/A	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	N/A
Numenius phaeopus	Whimbrel	N/A	Migratory	Marine	Roosting known to occur within area	Endangered

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Charadrius leschenaultii	Greater Sand Plover	Vulnerable	Migratory	Marine	Species or species habitat likely to occur within area	Vulnerable*
Charadrius bicinctus	Double-banded Plover	N/A	Migratory	Listed - overfly marine area	Roosting known to occur within area	N/A
Pluvialis squatarola	Grey Plover	Vulnerable	Migratory	Listed - overfly marine area	Roosting known to occur within area	Vulnerable
Charadrius veredus	Oriental Plover	N/A	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	N/A
Gallinago hardwickii	Latham's Snipe	Vulnerable	Migratory	Listed - overfly marine area	Species or species habitat known to occur within area	N/A
Charadrius mongolus	Lesser Sand Plover	Endangered	Migratory	Marine	Roosting known to occur within area	Endangered
Pluvialis fulva	Pacific Golden Plover	N/A	Migratory	Marine	Roosting known to occur within area	Vulnerable
Arenaria interpres	Ruddy Turnstone	Vulnerable	Migratory	Marine	Roosting known to occur within area	Endangered
Xenus cinereus	Terek Sandpiper	Vulnerable	Migratory	Listed - overfly marine area	Roosting known to occur within area	Endangered
Tringa stagnatilis	Marsh Sandpiper	N/A	Migratory	Listed - overfly marine area	Roosting known to occur within area	Endangered
Tringa glareola	Wood Sandpiper	N/A	Migratory	Listed - overfly marine area	Roosting known to occur within area	Endangered*

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Calidris alba	Sanderling	N/A	Migratory	Marine	Roosting known to occur within area	N/A
Calidris pugnax	Ruff	N/A	Migratory	Listed - overfly marine area	Roosting known to occur within area	N/A
Tringa brevipes	Grey-tailed Tattler	N/A	Migratory	Marine (as *Heteroscelus brevipes*)	Roosting known to occur within area	Critically Endangered
Calidris ruficollis	Red-necked Stint	N/A	Migratory	Listed - overfly marine area	Roosting known to occur within area	N/A
Numenius minutus	Little Curlew	N/A	Migratory	Listed - overfly marine area	Roosting likely to occur within area	N/A
Seabirds						
Sternula nereis nereis	Australian Fairy Tern	Vulnerable	N/A	N/A	Foraging, feeding or related behaviour likely to occur within area	Critically Endangered
Sternula albifrons	Little Tern	Vulnerable	Migratory	Marine (as *Sterna albifrons*)	Species or species habitat may occur within area	Critically Endangered
Ardenna grisea	Sooty Shearwater	Vulnerable	Migratory	Marine (as *Puffinus griseus*)	Species or species habitat may occur within area	N/A
Ardenna carneipes	Flesh-footed Shearwater	N/A	Migratory	Marine (as *Puffinus carneipes*)	Foraging, feeding or related behaviour likely to occur within area	N/A

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Diomedea antipodensis	Antipodean Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Diomedea antipodensis gibsoni	Gibson's Albatross	Vulnerable	N/A	Marine (as *Diomedea gibsoni*)	Foraging, feeding or related behaviour likely to occur within area	N/A
Diomedea epomophora	Southern Royal Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	Critically Endangered
Diomedea exulans	Wandering Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	Critically Endangered*
Diomedea sanfordi	Northern Royal Albatross	Endangered	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea)	Vulnerable	N/A	N/A	Species or species habitat likely to occur within area	N/A
Halobaena caerulea	Blue Petrel	Vulnerable	N/A	Marine	Species or species habitat may occur within area	N/A
Hydroprogne caspia	Caspian Tern	N/A	Migratory	Marine	N/A	Vulnerable
Gelochelidon macrotarsa	Australian Gull-billed Tern	N/A	Migratory	Marine	N/A	Endangered
Macronectes giganteus	Southern Giant-Petrel	Endangered	Migratory	Marine	Species or species habitat may occur within area	Endangered*

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Macronectes halli	Northern Giant Petrel	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	Endangered*
Numenius madagascariensis	Eastern Curlew	Critically Endangered	Migratory	Marine	Species or species habitat known to occur within area	Critically Endangered
Pachyptila turtur subantarctica	Fairy Prion (southern)	Vulnerable	N/A	N/A	Species or species habitat known to occur within area	N/A
Phoebetria fusca	Sooty Albatross	Vulnerable	Migratory	Marine	Species or species habitat may occur within area	Critically Endangered*
Pterodroma leucoptera leucoptera	Gould's Petrel	Endangered	N/A	N/A	Species or species habitat may occur within area	N/A
Thalassarche bulleri	Buller's Albatross	Vulnerable	Migratory	Marine	Species or species habitat may occur within area	Endangered*
Thalassarche bulleri platei	Northern Buller's Albatross	Vulnerable	N/A	Marine (as *Thalassarche sp. nov.*)	Species or species habitat may occur within area	N/A
Thalassarche carteri	Indian Yellow-nosed Albatross	Vulnerable	Migratory	Marine	Species or species habitat likely to occur within area	Endangered*
Thalassarche cauta	Shy Albatross	Endangered	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	Endangered
Thalassarche chrysostoma	Grey-headed Albatross	Endangered	Migratory	Marine	Species or species habitat may occur within area	Endangered*

Scientific Name	Common Name	EPBC Act			PMST presence within ECC and OWF area (including 5 km buffer)	FFG Act Threatened Status[1]
		Threatened Status	Migratory	Listed		
Thalassarche impavida	Campbell Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Thalassarche melanophris	Black-browed Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Thalassarche salvini	Salvin's Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour likely to occur within area	N/A
Thalassarche steadi	White-capped Albatross	Vulnerable	Migratory	Marine	Foraging, feeding or related behaviour known to occur within area	N/A
Puffinus tenuirostris	Short-tailed Shearwater	N/A	Migratory	Marine	N/A	N/A
Thalasseus bergii	Greater Crested Tern	N/A	Migratory	Marine (as *Sterna bergii*)	N/A	N/A
Vegetation						
Avicennia marina subsp. *australasica*	Grey Mangrove	N/A	N/A	Marine	N/A	Endangered

Seabirds

For the purpose of this report, the group 'seabirds' refers to any bird species specifically adapted to marine ecosystems, particularly those with high mobility that reside in open ocean environments and coastal regions, including species such as albatrosses, petrels, and shearwaters.

A total of 68 threatened and migratory bird species (of which 14 are listed as threatened, 23 listed as Migratory, and 31 listed as both threatened and migratory), was identified that may potentially occur within the ECC and OWF area (inclusive of a 5 km buffer). Seabirds account for 28 of the total listed bird species that may potentially interact with Project activities. Albatross and petrel species were the dominant group of seabirds which coincides with the bird BIAs identified that are overlapped by the ECC and OWF area.

Foraging BIAs for a number of Threatened and Migratory seabirds that are overlapped by the ECC and OWF area include:

- Wandering albatross (*Diomedea exulans*);
- Common diving-petrel (*Pelecanoides urinatrix*);
- Buller's albatross (*Thalassarche bulleri*);
- Indian yellow-nosed albatross (*Thalassarche chlorohynchos bassi*);
- Black-browed albatross (*Thalassarche melanophris*);
- Campbell albatross (Thalassarche melanophris impavida);
- Short-tailed shearwater (*Ardenna tenuirostris*);
- Shy albatross (*Thalassarche cauta*); and
- White-faced storm-petrel (*Pelagodroma marina*).

Albatross and petrel species largely breed in Antarctica and islands south of Australia (DSEWPaC 2011). Albatross and giant petrel species exhibit a broad range of diets and foraging behaviours, and hence their at-sea distributions are diverse. Combined with their ability to cover vast oceanic distances, all waters within Australian jurisdiction can be considered foraging habitat, however the most critical foraging habitat is considered to be those waters south of 25 degrees where most species spend the majority of their foraging time.

Seabirds are known to feed on fish, cephalopod and/or crustaceans within the marine environment, diving to the surface water level or just below. Butler et al. (2002) describes the Bonney Upwelling as being a significant attractant for seabirds.

It is noted that known seabird rookeries located at Seal Island, Notch Island, Rag Island and Cliffy Island (approximately 44 km south-west of the OWF area) provide important habitat for a number of species, although not all are listed Threatened or Migratory under the EPBC Act. These species include:

- Short-tailed shearwater;
- Greater crested tern;
- Fairy prion;
- Little penguin;
- Common diving petrel;

- Black-faced cormorant;
- Pacific Gull; and
- Silver Gull.

Shorebirds

For the purpose of this report the group 'shorebirds' refers to bird species that are commonly found in shoreline and coastal habitats, as well as estuaries and wetlands, with a particular focus on those that engage in long-distance international migrations, including species such as sandpipers, plovers, and godwits.

Shorebirds account for 32 of the total listed bird species (68 listed bird species) that may potentially occur within the ECC and OWF area and account for the majority of identified bird species identified. Sandpiper, snipe and godwit species were the dominant groups to occur.

International migratory shorebirds refer to shorebirds and waders that typically migrate on an annual basis through the East Asian-Australasian Flyway (Bamford et al. 2008). These species breed in wetland environments in the northern hemisphere during the northern summer, before migrating south to Australia and other locations over winter (Australian summer). As part of the annual migration, shorebirds tend to aggregate at significant coastal wetland and intertidal sites across Australia, with smaller aggregations occurring in inland habitats. The Referral Area and surrounds provides suitable roosting and foraging habitat for shorebirds, including intertidal mud flats, shoals, reef and beach habitats, particularly around the nearby Ramsar wetland areas. These species would congregate around nearshore habitats but may occasionally utilise the Referral Area for foraging purposes. Some species also migrate across Bass Strait to locations in Tasmania, potentially flying over the OWF area in the process.

Land Birds

For the purpose of this report, 'land birds' refers to bird species that are adapted to terrestrial habitats and undergo regular broadscale or regional, seasonal or annual movements/ migrations (e.g. parrots, raptors). Land birds account for seven of the total listed bird species (68 listed bird species) that may potentially occur within the ECC and OWF area.

The orange-bellied parrot (**OBP**) (*Neophema chrysogaster*) inhabits coastal and surrounding areas including saltmarshes, littoral heathlands and scrublands. They breed in Tasmania and migrate to southern mainland Australia for winter. The OBP inhabits coastal areas including saltmarshes, littoral heathlands and scrublands. The birds typically migrate to Victoria towards Port Phillip Bay, then disperse east and west, along the Victorian coastline.

Similarly, swift parrots breed in Tasmania and migrate to mainland Australia in autumn. The parrots disperse across a broad landscape during winter, foraging on nectar in eucalypt woodland habitat, mainly in inland Victoria and New South Wales. The migratory pathways of the swift parrot are not well understood. Whilst the Referral Area does not contain breeding or foraging habitat for the species, it is possible that individuals pass through the OWF area and ECC whilst migrating to their preferred habitat in Tasmania. The National Recovery Plan for the Swift Parrot (Commonwealth of Australia, 2024) lists the construction of wind turbines in South-eastern Australia as a potential threat to survival of the species, particularly if they are poorly sited.

Blue-winged parrots breed on mainland Australia in southern Victoria from Port Albert to Nelson, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania (Emison et al. 1987; Higgins 1999). Variable numbers of birds are known to migrate across Bass Strait in winter and spend the breeding season occupying eucalypt forests and woodlands (Higgins 1999).

The white-throated needletail is widespread across eastern, south-eastern Australia and Tasmania (Barrett et al. 2003; Blakers et al. 1984; Higgins 1999). They migrate to Australia from eastern Siberia, north-eastern China and Japan between August and November, moving south towards Victoria and Tasmania to spend their non-breeding season. As the species moves south through Australia towards Tasmania, there is potential for white-throated needletails to pass through the OWF area (Emison et al. 1987; Higgins 1999; Chantler 1999; Dement'ev & Gladkov 1951).

Marine Mammals

Southern Right Whale

In Australia, two sub-populations of southern right whale are found: the south-western subpopulation found off Western Australia and South Australia (around 2,675 individuals) (Smith et al. 2023); and the south-eastern subpopulation off Victoria, New South Wales and Tasmania (around 270 individuals) (Stamation et al. 2020). Although southern right whales are listed as Least Concern in the International Union for Conservation of Nature (**IUCN**) Red List, they are EPBC-listed as Endangered and Migratory.

Southern right whales typically migrate from foraging areas south of Australia between ~40ºS and 65ºS towards Australian coastal waters where they can be found from late April to November. The southern right whale migration BIA includes all southern Australian waters out to 200 nm offshore and overlaps the OWF area and ECC. The migration BIA is used seasonally from April to October, although numbers in the Gippsland region 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 Victorian State waters out to 2.5 km from shore (Figure 4-5). Under the National Recovery Plan for the Southern Right Whale, Reproduction BIAs across the species range are considered Habitat Critical to the Survival of the species, including being critical for expanding habitat occupancy, with typical usage from May to September (DCCEEW, 2024). In coastal habitat, southern right whales typically aggregate in shallow waters, within two kilometres of the coast.

Females of this species reach sexual maturity at 5-6 years old and typically breed every 3 years, although recent research shows apparent mean age of first parturition for females at a major calving ground at the Head of Bight, SA, is 9 years and calving intervals have increased to 4 years (Charlton et al. 2022). Pregnancy lasts 11-12 months with reproduction and calving taking place during the winter months. Calves weigh approximately 1 tonne at birth, grow very quickly during early development, and are weaned at 11-12 months (DELWP, 2017). During winter, southern right whales can be found along most of Victoria’s coastline, where they usually travel close to the surface as singletons, in pairs or in groups of three, with larger numbers congregating at important calving areas. Logan's Beach at Warrnambool has been a favoured area for southern right whale in Victoria for many years as it is the only place where females regularly return from Antarctic waters to nurse and feed their young annually (DELWP, 2017). Elsewhere in Victoria, small but growing numbers of non-calving whales regularly

aggregate intermittently in coastal waters off Peterborough, Port Campbell, Port Fairy and Portland (DSEWPaC 2012). Breeding may also occur in the Wilson's Promontory area and there are increasingly regular records of short-term use by mother-calf pairs along the Victorian coastline (Stamation et al. 2020, Watson et al. 2021, DCCEEW 2024). Some female southern right whales also give birth in Tasmanian waters, typically between May and November each year, most commonly in sheltered waters on the east coast (Threatened Species Section, 2025).

Blue Whale

Two subspecies of blue whale 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. brevicauda*) (**PBW**). Blue whales generally undertake an annual migration from higher latitude feeding grounds in summer to lower latitude breeding grounds in winter.

There are three recognised populations found in Australia: 1) Antarctic blue whales that feed in waters south of 60ºS 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 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 found along the eastern Australian coast, in New Zealand and the western Pacific Ocean, with their primary niche being the South Taranaki Bight (Barlow et al. 2023).

Eastern Indian Ocean pygmy blue whales are typically present in the central and western Bass Strait during their migration along the southern coast of Australia. They are most commonly observed from late summer to early autumn, particularly between February and April (McCauley et al., 2018). These periods coincide with the upwelling events off the coast of South Australia and Victoria that bring nutrient-rich waters to the surface, providing an abundant food source for the whales (McCauley et al., 2018).

Based on their migration patterns and acoustic detections of blue whales within the Bass Strait, the NSW coast, Antarctica and New Zealand, seasonality of blue whales in the Gippsland region is not strong and most individuals present in eastern Bass Strait are likely to be rare or vagrant New Zealand pygmy blue whales, with inferred presence of migrating Antarctic blue whales (McCauley et al., 2018, Barlow et al., 2023). Animals are likely to be migrating through the area rather than forming strong seasonal foraging aggregations, although opportunistic feeding may occur. Eastern Indian Ocean pygmy blue whales have only rarely been recorded on Australia's east coast (Balcazar et al. 2015) or in New Zealand (Barlow et al. 2023) and are only occasionally likely to be present as far east as the OWF area and ECC, with most individuals found further west at known feeding areas (Barlow et al. 2023, Ferreira et al. 2024).

Perth Canyon and the Bonney Upwelling System are areas of known feeding aggregations and are considered annual high-use BIAs for this species, critical to their survival as they seasonally support highly productive waters for blue whale aggregations. 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, Möller et al. 2020).

Although the main feeding aggregation areas are located west of the OWF area and the ECC, with the Bonney Upwelling considered the primary foraging area for blue whales in south-eastern Australia, feeding is also known to occur in areas 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. Therefore, there is the potential for foraging blue whales to pass through the OWF area and the ECC between November and April.

Fin Whale

Fin whales are found predominantly in deeper offshore waters and only rarely in inshore waters, undertaking annual migrations poleward in summer to feed. Their winter distribution is poorly known but acoustic recordings from around Australia suggest they are likely to be present in southern Australian waters between June and November (Aulich et al. 2022).

Fin whales become sexually mature at 6–10 years of age and the average length of Southern Hemisphere animals (at sexual maturity) is 19 m for males and 20 m for females (Laws 1961). Age of first reproduction is around 10 years (Taylor et al. 2007). Breeding in the Southern Hemisphere occurs between May-July and gestation lasts around 11 months, however, the location of breeding grounds is not well known (Aguilar 2009). The mean calving interval is two to three years (Agler et al. 1993; Laws 1961). Weaning occurs around 6-7 months and is followed by a resting period of six months when mating then takes place (Aguilar 2009).

Fin whales are more gregarious than other baleen whales, and often occur in groups of 6–10, though single animals and pairs are more common. Aggregations of over 100 whales may be observed on feeding grounds (Watkins et al. 1987) but are unlikely in Australian waters. Gill et al. (2015) recorded eight fin whales during 11 years of aerial surveys from eastern Great Australian Bight to western Bass Strait, including observations of feeding behaviour.

There are no known mating or calving areas in Australian waters and no BIAs have been declared. The sighting of a cow and calf in the Bonney Upwelling in April 2000 and the stranding of two fin whale calves in South Australia suggest that this area may be important to the species' reproduction, perhaps as a provisioning area for mothers with calves (Morrice et al. 2004).

Records of fin whales in Bass Strait are infrequent, but they may be present in the OWF area and possibly feed in the region, especially during upwelling episodes, but numbers are likely to be low. Sightings in inshore waters are unlikely.

Sei Whale

Sei whales are considered a cosmopolitan species, ranging from polar to tropical waters, but tend to be found further offshore than other species of large whales. They show well defined migratory movements between polar, temperate and tropical waters (Mackintosh 1965) with predominantly north-south movements and little longitudinal dispersion.

Sei whales move between Australian waters and Antarctic feeding areas; subantarctic feeding areas (e.g. Subtropical Front); and tropical and subtropical breeding areas. The proportion of the global population in Australian waters is unknown as there are no estimates for sei whales in Australian waters. It is likely that threats affecting the global population of sei whales would also affect Australian populations (Horwood 1987).

Sei whales have been infrequently recorded in Australian waters (Bannister et al. 1996). However, the similarity in appearance of sei whales and Bryde's whales (*Balaenoptera edeni*) has resulted in confusion about distributional limits and frequency of occurrence. Sei whales have been sighted 20–60 km offshore on the continental shelf in the Bonney Upwelling (Miller et al. 2012) where opportunistic feeding has been observed between November and May (Gill et al. 2015). Sei whales were reported 200 nm south-west of Port Lincoln in December 1995 and a concentration of sei whales was reported at the western end of Bass Strait (Kato et al. 1996).

There is insufficient data on sei whale migration, however, they have been sighted inshore in the proximity of the Bonney Upwelling, Victoria, along the continental shelf during the summer and autumn months (Gill 2002). The Australian Antarctic waters are important feeding grounds for sei whales, as are temperate, cool waters (Horwood 1987). Foraging, feeding or related behaviour is likely to occur in the region, and sightings of sei whales feeding in the Bonney Upwelling area indicate a potentially important feeding ground (Morrice et al. 2004, Gill et al. 2015).

Sei whales reach sexual maturity between 6–8 years for males and 7.5–8.35 years for females. The age of first reproduction is around 9-10 years and the inter-birth interval is 2.5 years (Taylor et al. 2007). The main breeding season is in winter (April to August) in the Southern Hemisphere, with gestation between 10.5–12.5 months (Horwood 1987). Calves are generally weaned in seven months (Horwood 2009). Breeding occurs in tropical and subtropical waters, however, there are no known mating or calving areas in Australian waters (Parker 1978).

Marine Turtles

The identified marine turtle species 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 recorded along most of the southern Victorian coastline (Department of Sustainability and Environment, 2009). It is therefore likely that marine turtles encountered in the Referral Area would be leatherback turtles. Green turtles and loggerhead turtles are less common in waters off Victoria (Commonwealth of Australia, 2017).

There are no turtle BIAs or Habitat Critical to the Survival of Marine Turtles within the Referral Area. However, the northern Bass Strait is known to be 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). Hays et al. (2023) also identified southeast Australia as a globally important foraging area for the species, with the major anthropogenic threat from entanglement in fishing gear. In the Bass Strait, leatherback turtles may congregate in areas where southward flowing warm currents converge with steep bathymetric contours, with most sightings occurring between January and May (Department of Sustainability and Environment, 2009).

Fish and Sharks

White Shark

The white shark (*Carcharodon carcharias*) is widely, but not evenly, distributed in Australian waters, with observations more frequent in and around fur seal and Australian sea lion colonies such as the Neptune Islands in South Australia (Malcolm et al., 2001; EA, 2002).

Juvenile white sharks aggregate seasonally in key areas such as Ninety Mile Beach, which is overlapped by the ECC (DEWHA, 2010). The Referral Area overlaps a BIA for the species (for breeding purposes). Therefore it is likely that the species would frequent the Referral Area. The main threats faced by white sharks in Australian waters are from interactions with commercial and recreational fisheries and shark control programs (DEWHA, 2010).

Whale Shark

The whale shark is widespread across Australia and is found less commonly in Victoria and South Australia and most commonly in northern Western Australia, Northern Territory and Queensland (TSSC, 2015). The species inhabits oceanic and coastal, tropical to warm temperate waters, often seen far offshore and generally encountered close to the water surface (TSSC, 2015). There are no known congregation sites for whale sharks in Victoria, and the Referral Area lies in the southern-most distribution of this species. Therefore, it is possible the species would be encountered in the Referral Area, but likely in very low numbers.

Australian Grayling

The Australian grayling (*Prototroctes maraena*) 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). This species migrates between freshwater streams, 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. Juveniles migrate back into fresh water after approximately 6 months (Backhouse et al. 2008; Amtstaetter et al. 2015).

In Victoria during the 1980s, this species was 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 (DPI, 2015).

4.3.3.2 THREATENED ECOLOGICAL COMMUNITIES

TECs are protected under the EPBC Act. One marine TEC, the subtropical and temperate coastal saltmarsh has a likelihood to occur within the Referral Area. The subtropical and temperate coastal saltmarsh ecological community is mainly associated with the soft substrate shores of estuaries and embayments and not the open ocean shorelines.

As such the TEC is not anticipated to occur in the offshore component of the ECC.

4.3.3.3 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 and/or over the continental shelf of Australia, that is not State or territorial 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 Referral Area are within the SEMR of the Commonwealth Marine Area. However, no Commonwealth-designated KEFs occur within or near the Referral Area, with nearest being the Upwelling East of Eden, located approximately 60 km north-east of the Referral 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, 2013). Fourteen Australian Marine Parks are within the SEMR, including the Beagle Marine Park, which is located approximately 38 km south-west of the Referral Area (as outlined in Section 4.3.3.4).

4.3.3.4 RAMSAR WETLANDS

Two wetlands of international importance are within proximity to the Referral Area, including:

- Corner Inlet Ramsar site is located to the southwest, adjacent to the Referral Area
- Gippsland Lakes Ramsar site is located approximately 8 km north-east of the ECC

The Gippsland Lakes Ramsar site is a hinterland wetland with very limited ocean connections (the main one being located at Lakes Entrance approximately 80 km away from the Project). In addition, the Project is hydrologically separated from the Ramsar site via the Merriman Creek. Considering separation and nearshore and onshore activities, direct Project impacts to the Ramsar site are considered unlikely and have not been discussed further in this report.

Corner Inlet

Although the Corner Inlet Ramsar wetland does not directly overlap with the Referral Area footprint, the Ramsar Site is subject to coastal intertidal influences, supports migratory shorebirds and, given the proximity to the Project, may be subject to potential indirect impacts.

The Corner Inlet Ramsar site is the most southerly marine embayment and intertidal system of mainland Australia, covering approximately 67,186 ha on Victoria's southeastern coast (DEPI, 2013). It includes marine embayment, tidal channels and sandy barrier islands. River and creek mouths are included as part of the Corner Inlet Ramsar site, however most of the rivers and creeks that flow into the inlet from mainland catchments are excluded (DEPI, 2013).

The Corner Inlet Ramsar site supports at least 20% of Victoria's wader bird population and is thought to support 15% of the global population of the eastern curlew (Mansergh & Norris 1982). The coastal environment and sandy islands within the site are covered by mangroves, saltmarshes, sandy beaches and intertidal mudflats, as well as an extensive bed of the endangered seagrass, *Posidonia australis* (O'Hara et al., 2002).

4.3.4 MARINE AND COASTAL PROTECTED AREAS

Australian Marine Parks are marine protected areas located within Australian Commonwealth waters and are managed by the Australian Government. These waters generally extend from 3 nm off the coast to the outer limit of Australia's Exclusive Economic Zone at 200 nm. State Marine Protected Areas are regions in State waters that are reserved to protect environmental, historical, or cultural features, and are managed by Parks Victoria.

The Referral Area lies directly adjacent to Ninety Mile Beach Marine National Park and there are several protected areas that are in close proximity to the Referral Area boundaries. These protected areas are identified in Table 4-5 and presented in Figure 4-15. Protected areas overlapping or within 5 km of the Referral Area are described in more detail in the following subsections.

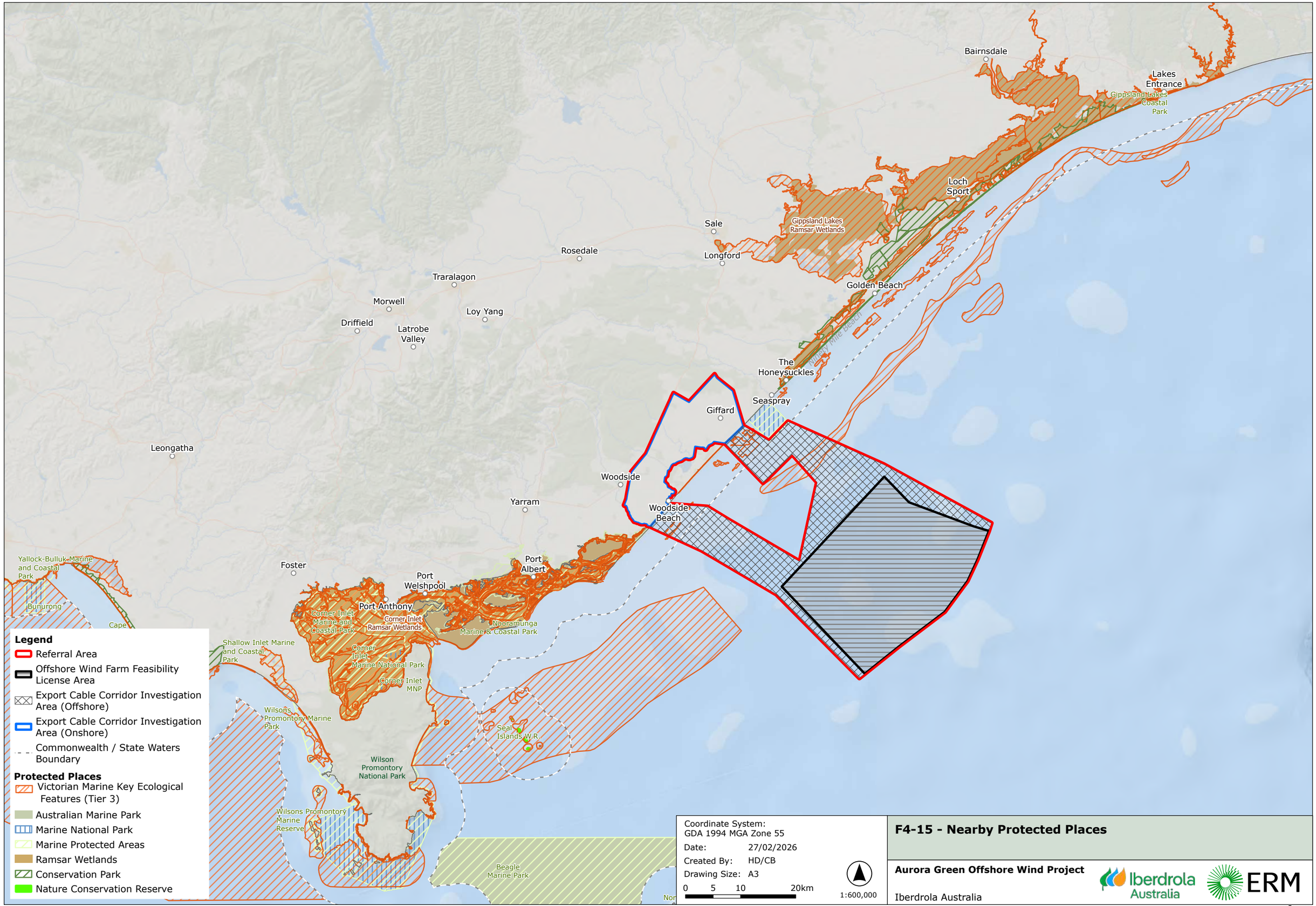
TABLE 4-5 PROTECTED PLACES AND OTHER SENSITIVE AREAS

Protected Area	Distance and Direction from Referral Area (OWF area and ECC)	Jurisdiction	IUCN category* or relevant park zone
Marine			
Beagle Marine Park	38 km south-west	Commonwealth	Multiple Use Zone (IUCN VI)
Marine and Coastal			
Ninety Mile Beach Marine National Park	Directly adjacent	Victoria	National Park Zone (IUCN II)
Nooramunga Marine and Coastal Park	Directly adjacent	Victoria	Multiple Use Zone (IUCN VI)
Jack Smith Lake W.R Natural Features Reserve	0.2 km outside	Victoria	Multiple Use Zone (IUCN VI)
Fresh-water Swamp, Woodside Beach W.R Natural Features Reserves	0.5 km north-west	Victoria	Multiple Use Zone (IUCN VI)
Lake Denison W.R Natural Features Reserve	3 km north-east	Victoria	Multiple Use Zone (IUCN VI)
Darriman H29 B.R Natural Features Reserve	3 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)
Gippsland Lakes Coastal Park	8 km north-east	Victoria	Multiple Use Zone (IUCN VI)
Giffard H31 B.R. Natural Features Reserve	8 km north	Victoria	Habitat/Species Management Area (IUCN IV)
Warrigal Creek SS.R Natural Features Reserve	8 km north-west	Victoria	Natural Feature (IUCN III)
Woodside H28 B.R. Natural Features Reserve	8 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)
Woodside H27 B.R. Natural features Reserve	8.5 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)

Protected Area	Distance and Direction from Referral Area (OWF area and ECC)	Jurisdiction	IUCN category* or relevant park zone
Giffard (Rifle Range) F.R. Nature Conservation Reserve	9 km north-west	Victoria	Strict Nature Reserve (IUCN Ia)
Woodside H25 B.R. Natural features Reserve	9 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)
Woodside H26 B.R. Natural features Reserve	9.5 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)
Giffard H30 B.R. Natural Features Reserve	10 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)
Mullungdung F.F.R. Nature Conservation Reserve	11 km north-west	Victoria	Strict Nature Reserve (IUCN Ia)
Darriman H33 B.R. Natural Features Reserve	12 km north-west	Victoria	Habitat/Species Management Area (IUCN IV)
Seal Islands W.R. Nature Conservation Reserve	44 km south-west	Victoria	Strict Nature Reserve (IUCN Ia)
Wilsons Promontory Marine Park	46 km south-west	Victoria	Multiple Use Zone (IUCN VI)
Wilsons Promontory National Park	46 km south-west	Victoria	National Park Zone (IUCN II)
Wilsons Promontory Wilderness Zone	46 km south-west	Victoria	Wilderness Area (IUCN Ib)
Corner Inlet Marine and Coastal Park	49 km south-west	Victoria	Multiple Use Zone (IUCN VI)
Corner Inlet Marine National Park	49 km south-west	Victoria	Multiple Use Zone (IUCN VI)
Hogan Group Conservation Area	51 km south-west	Victoria	Multiple Use Zone (IUCN VI)
Kent Group National Park	62 km south	Victoria	National Park Zone (IUCN II)
Wilsons Promontory Marine National Park	65 km south-west	Victoria	National Park Zone (IUCN II)

Protected Area	Distance and Direction from Referral Area (OWF area and ECC)	Jurisdiction	IUCN category* or relevant park zone

Ia: Protected area managed mainly for science.
Ib: Protected are similar to strict nature reserve, generally larger and less stringently protected.
II: Protected area managed mainly for ecosystem conservation and recreation.
III: Protected area managed mainly for natural monuments or features and their surrounding habitats.
IV: Protected area managed mainly for conservation through management intervention.
VI: Protected area with sustainable use of natural resources – allow human use but prohibits large scale development.
IUCN categories for the marine park are provided and, in brackets, the IUCN categories for specific zones within each Marine Park as assigned under the North-west Marine Parks Network Management Plan 2018 and South-west Marine Parks Network Management Plan 2018.



F4-15 - Nearby Protected Places

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R7.aprx/0758202-FIG-PMAR-003-V2.6

Source:
Base Data: VicMap

4.3.4.1 CORNER INLET

The Corner Inlet is located adjacent south-west to the Referral area. It encompasses the Corner Inlet Ramsar Site (Commonwealth designation), Corner Inlet Marine and Coastal Park, and Corner Inlet Marine National Park.

The Corner Inlet Marine and Coastal Park, classified under IUCN Category VI (Protected Area with sustainable use of natural resources), covers approximately 28,500 ha and provides a mosaic of habitats that support recreational activities while conserving biodiversity.

Adjacent to this, the Corner Inlet Marine National Park is designated as IUCN Category II (National Park), protecting 1,550 ha of marine ecosystems, including Victoria's only large meadows of Broad-leaved Seagrass (Posidonia australis). Together, these areas form a significant conservation corridor within the Ramsar-listed wetland of international importance.

4.3.4.2 NINETY MILE BEACH MARINE NATIONAL PARK

Ninety Mile Beach MNP lies directly adjacent to the Referral Area. The park forms a square and extends along the coastline and offshore for approximately 5 km (3 nm) (Parks Victoria, 2006a).

Ninety Mile Beach MNP is assigned the IUCN Category II (managed primarily for ecosystem protection and recreation) and protects an example of an internationally significant subtidal sandy environment, recognised for its exceptionally high diversity of marine invertebrates. Offshore low calcarenite reefs are habitat to a unique invertebrate biota. The long sandy beach provides extensive habitat for migratory shorebirds (Parks Victoria, 2006a).

4.3.4.3 GIPPSLAND LAKES COASTAL PARK

Gippsland Coastal Park is located 8 km north-east of the Referral Area. The park is a narrow coastal reserve covering 17,600 ha along a portion of Ninety Mile Beach from Seaspray to Lakes Entrance (Parks Victoria, n.d.).

Gippsland Lakes Coastal Park is assigned the IUCN Category VI (multiple use zone) and protects an interconnected area of wetlands and coastline, containing diverse terrestrial and marine environments and providing extensive recreational activities (Parks Victoria, 2025). The lakes attract a large concentration of migratory waders and hosts breeding colonies of several shorebird species (Parks Victoria, n.d.).

4.3.4.4 NOORAMUNGA MARINE AND COASTAL PARK

Nooramunga Marine and Coastal Park lies directly adjacent to the ECC. The marine and coastal park covers over 30,000 ha and consists of sand barrier islands, shallow waters, intertidal mudflats and isolated granite islands (Parks Victoria, 2012).

Nooramunga Marine and Coastal Park is assigned to the IUCN Category VI (multiple use zone) and protects a portion of the Corner Inlet Ramsar site (see section 4.3.3.4). This area is also highly valued for recreational activities, such as bird watching, camping and fishing (Parks Victoria, 2012).

4.3.4.5 NATURAL FEATURES RESERVES

A number of natural features reserves are located in close proximity to the Referral Area, including:

- Jack Smith Lake W.R Natural Features Reserve
- Lake Denison W.R Natural Features Reserve
- Fresh-water Swamp, Woodside Beach W.R Natural Features Reserves
- Darriman H29 B.R Natural Features Reserve

These reserves feature a variety of natural habitats, including coastal lagoons, salt marshes, grasslands, and woodlands. They support protected species like waterbirds, kangaroos, and koalas. Designated for both conservation and regulated recreation, they generally align with IUCN Category VI, promoting sustainable use of natural resources.

Conservation efforts, including fox control programs, help safeguard these native populations. The reserve also holds cultural importance for the Gunaikurnai people and a number of these are jointly managed to balance conservation with public access and traditional practices.

4.3.5 VICTORIAN BIODIVERSITY VALUES

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

4.3.5.1 NATIVE VEGETATION

The Referral Area is located adjacent to the Gippsland Plain bioregion. Vegetation in the bioregion is characterised by a variety of vegetation types and influenced by low lying alluvial and coastal plains, barrier dunes, flood plains and swampy flats.

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.' Seagrass and algae may potentially be considered native vegetation and is present in coastal waters near the Referral Area. However, the native vegetation requirements under the Victorian Planning Provisions only apply to onshore environments and do not extend offshore.

4.3.5.2 THREATENED ECOLOGICAL COMMUNITIES

Various communities of flora and fauna are currently listed as 'threatened' and protected under the FFG Act in Victoria. The FFG act has two listed marine communities, the San Remo Marine Community and the Port Phillip Bay Entrance Deep Canyon Marine Community. One coastline community, the Coastal Moonah Woodland Community occurs in Victoria, however it is described to occur on alkaline soils between Phillip Island and Lorne, with disjunct occurrences west of Portland. Neither of the communities are considered to be within 100 km proximity to the Referral Area.

4.3.5.3 THREATENED SPECIES

A total of 49 FFG Act listed threatened species have been identified from both the VBA and the PMST searches (Appendix A). Refer to Table 4-4 in Section 4.3.3.1 for the FFG Act listed threatened species that potentially occur within the OWF area and the ECC.

4.4 SOCIO-ECONOMIC ENVIRONMENT

4.4.1 COASTAL COMMUNITIES

A number of communities are situated along the coastline that overlook the Referral Area. Although these are not located within the OWF area or ECC, they are relevant to the assessment of potential indirect impacts on communities in the State jurisdiction. Coastal settlements in proximity and adjacent to the Referral Area are listed in Table 4-6 below.

TABLE 4-6 COASTAL COMMUNITIES

Coastal Community	Population[3]	Distance and direction from Referral Area
Woodside Beach	114	1 km north-east
McLoughlins Beach	121	4 km south-west
Seaspray	373	8 km north-east
The Honeysuckles	131	12 km north-east
Manns Beach	29	14 km south-west
Glomar Beach	21	21 km north-east

4.4.2 COMMERCIAL FISHERIES

A review of fishing density data for Commonwealth (Figure 4-16) and State-managed fisheries identified effort from eight fisheries within the OWF area and the ECC (Atlantis Fisheries Consulting Group, 2024). The nature of the way Victorian fishery data is reported means that it is inherently over-reported. Five active Victorian-managed fisheries had less than five vessels reporting catch over the 20-year data period, of which the annual catch data remains confidential. In some instances, this is an indication of low catch but in other fisheries, potentially such as the Victorian Purse Seine (Ocean) Fishery, it might mean high catches from very few vessels. Publicly available data is presented in Table 4-7.

Fishing gears can be used across different fisheries and sometimes more than one type of fishing gear is used within a single fishery. Combined these eight active fisheries use nine types of fishing gear (VFA, 2025):

- Demersal gillnet;
- Demersal (horizontal) longline;
- Danish seine;
- Demersal (otter) trawl;
- Scallop dredge;
- Octopus pots/traps;
- Purse seine;
- Other Line methods (dropline, longline, handline); and
- Rock Lobster pots.

[3] ABS census data 2021 - https://www.abs.gov.au/census/find-census-data/quickstats

TABLE 4-7 COMMONWEALTH AND STATE-MANAGED FISHERIES AND FISHING EFFORT (2004-2023)

Fishery Name	Jurisdiction	TAC (tonnes)	Catch most recent year (tonnes)	Average annual catch in area (tonnes)	
		OWF area			ECC
SESSF Shark Gillnet and Shark Hook Sectors	Commonwealth	~2,555	2,392	12.9	1.59
SESSF Commonwealth Trawl Sector	Commonwealth	~28,097	12,641	3.1	0.38
Scallop (Ocean) Fishery	Victoria	135	17	56.7	24.1
Rock Lobster Fishery (Eastern Zone)	Victoria	32	15	0.08	*Confidential*
Octopus Fishery (Central and Eastern Zones)	Victoria	68.7	~62	*Confidential*	*Confidential*
Purse Seine (Ocean) Fishery	Victoria	N/A	269	*Confidential*	*Confidential*
Ocean (General) Fishery	Victoria	N/A	N/A	*Confidential*	*Confidential*
Trawl (Inshore) Fishery	Victoria	N/A	N/A	*Confidential*	*Confidential*
Total		**~31,182**	**15,537**	**73+**	**26+**

Melbourne
Frankston
Port of Hastings
Rosedale
Sale
Traralagon
Morwell
Loy Yang
Driffield
Bairnsdale
Lakes Entrance
Loch Sport
Golden Beach
The Honeysuckles
Seaspray
Giffard
Woodside
Yarram
Woodside Beach
Port Welshpool
Port Albert
Port Anthony

Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- Commonwealth / State Waters Boundary

SESSF Gillnet Hook and Trap Sector Shark Gillnet sub-sector relative fishing intensity

- High
- Medium
- Low

SESSF Commonwealth Trawl Sector trawl sub-sector relative fishing intensity

- High
- Medium
- Low

SESSF Commonwealth Trawl Sector Danish-seine sub-sector relative fishing intensity

- High
- Medium
- Low

Coordinate System:
GDA 1994 MGA Zone 55
Date: 07/10/2025
Created By: HD
Drawing Size: A3
0 10 20 30km
1:1,000,000

F4-16 - Commonwealth-managed Fisheries

Aurora Green Offshore Wind Project

Iberdrola Australia

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-007-V2.3

Source:
Base Data: VicMap

4.4.3 COMMERCIAL SHIPPING

The region supports significant commercial shipping activity. Analysis of vessel traffic data acquired through AMSA's Craft Tracking System determined that in 2024, most of the OWF area and the ECC had densities between one and ten vessels per year (Figure 4-17). The OWF area is located 8 km north of existing shipping routes.

Bairnsdale
Lakes Entrance
Loch Sport
Sale
Rosedale
Traralagon
Morwell
Loy Yang
Driffield
Golden Beach
Ninety Mile Beach
The Honeysuckles
Seaspray
Giffard
Woodside
Yarram
Woodside Beach
Port Albert
Port Welshpool
Port Anthony
Wilson Promontory National Park

Legend

- Referral Area
- Offshore Wind Farm Feasibility License Area
- Export Cable Corridor Investigation Area (Offshore)
- Export Cable Corridor Investigation Area (Onshore)
- Commonwealth / State Waters Boundary

Total 2024 CTS position records per 1km2

- 1
- 2
- 3
- 3 ≤ 5
- 5 ≤ 10
- > 10

Coordinate System:
GDA 1994 MGA Zone 55

Date: 07/10/2025

Created By: HD

Drawing Size: A3

0 5 10 20km

1:600,000

F4-17 - Vessel Density and Commercial Shipping

Aurora Green Offshore Wind Project

Iberdrola Australia

Iberdrola Australia ERM

0758202_PMAR_R6.aprx/0758202-FIG-PMAR-008-V2.3

Source:
Base Data: VicMap

4.4.4 TRADITIONAL OWNERS

The Gunaikurnai People hold registered Native Title over sections of the region to the north-east and along the coast, nearest to the OWF area and the ECC, and have a Traditional Owner Land Management Agreement in place. The Gunaikurnai Land and Waters Aboriginal Corporation (**GLaWAC**) (2023) state that:

"Our Country is the land, the rivers and the ocean, the people and the stories, the past and the future. All of it is connected. All of it is important to us. Country heals us and connects us to our ancestors, our culture and our history. We see no distinction between the land and the sea. It is all a part of our Country. But our connection to the coastal and marine parts of our Country is rarely recognised, so we need to be clear about how important it is to us".

For the Gunaikurnai peoples, Sea Country and Land Country are equally significant, and provide important cultural resources that have sustained local people for thousands of years, with many integral coastal land and sea environments that make up the Gunaikurnai cultural landscape. Coastal areas have historically been the most densely populated areas of Gunaikurnai Country, due to their abundant access to both marine and terrestrial food sources, and to islands in the Bass Strait, which were traditionally reached by bark canoes for hunting and fishing. Today, GLaWAC is passionate about re-establishing Gunaikurnai rights to access and recognise Sea Country as a resource. The Corporation highlight key aspirations in regard to improving local Aboriginal management and use of Sea Country, stating that "stronger involvement in the management of Sea Country can open up opportunities for improving economic outcomes for our mob, while better protecting our cultural heritage and improving environmental outcomes" (GLaWAC, 2023).

Additionally, GLaWAC have established a cultural water program to 'reconnect Traditional Owners and Aboriginal community members to water' in the local area, including through Aboriginal water assessments of local rivers, and knowledge sharing regarding local waterways (GLaWAC, 2023).

Further information on Traditional Owners and First Nations Cultural Values can be found in the *Aurora Green Offshore Wind Project: Preliminary Heritage Assessment* (ERM, 2025a).

4.4.5 INFRASTRUCTURE AND OTHER COMMERCIAL FACILITIES

Renewable industry

The Gippsland Declared Area (OEI-01-2022), covering around 15,000 km^2 of the Bass Strait, is anticipated to host a number of offshore wind projects, which will support Australia's transition towards net zero. Twelve feasibility licenses have been granted in the declared area.

Oil and gas

The OWF area and ECC are both within a greenhouse gas (**GHG**) Assessment Permit area (G-5-AP), which is held by the Crown in right of Victoria and is set to expire on 20th August 2026 (NOPTA, 2025). Activities under the permit include:

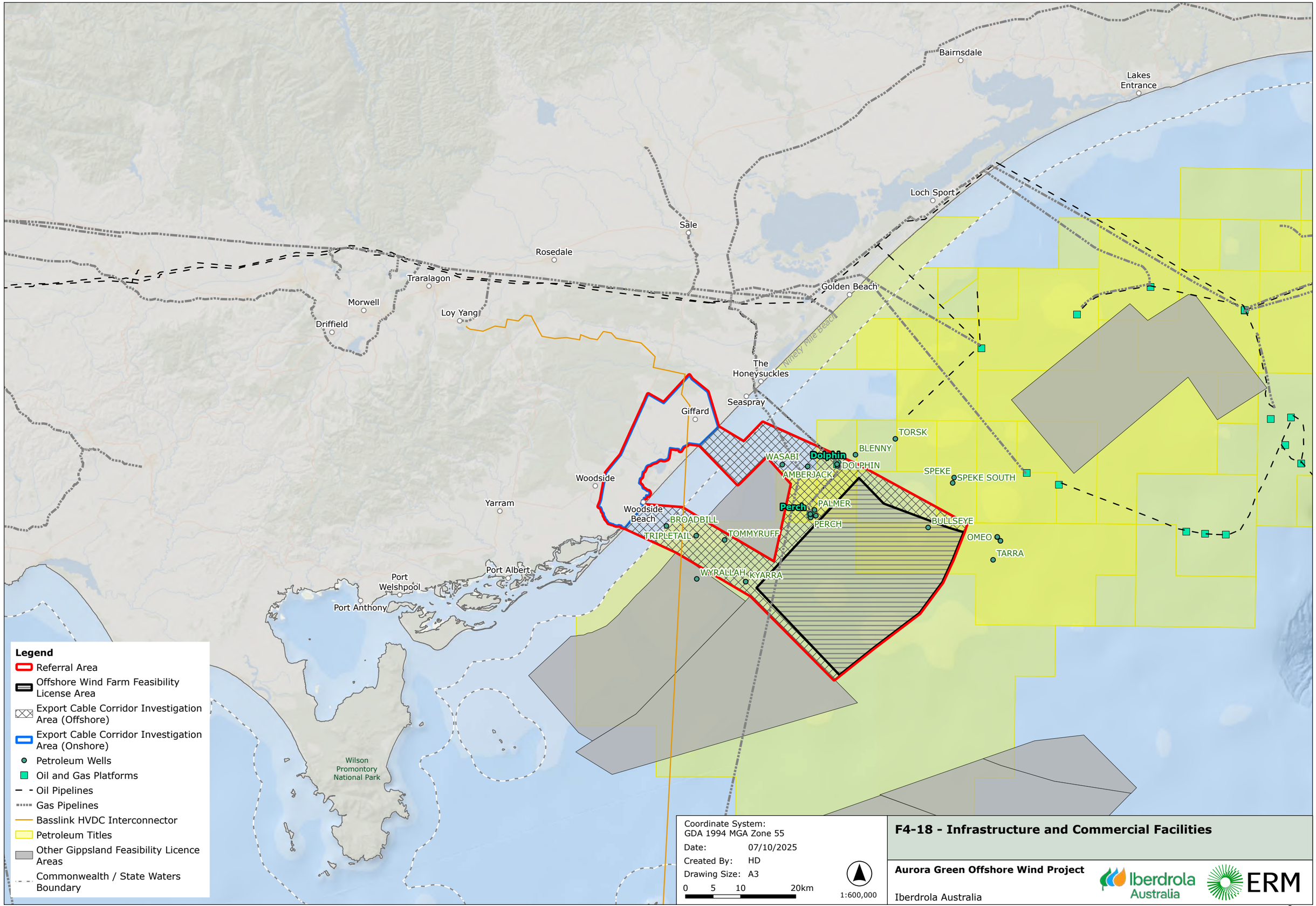
- Offset well study including consideration of integrity and abandonment status;
- Geological and geophysical modelling, analysis and interpretation of the storage formation; and

- Conceptual development planning.

The OWF area also overlaps 3D Energy's P74 exploration permit and Esso/Woodside's L15 production license, and the ECC overlaps Esso/Woodside's L17 production license. Infrastructure and other commercial facilities overlapping or in proximity to the Referral Area are presented in Table 4-8 and Figure 4-18.

TABLE 4-8 EXISTING OIL AND GAS INFRASTRUCTURE

Asset Name	Asset Type	Owner	Distance from Referral Area
Tasmanian Gas Pipeline	Gas Pipeline	Palisade Investment Partners, Zinfra Group	Overlaps OWF area and ECC
Dolphin	Offshore oil and gas platform	Esso Australia Resources Pty Ltd	Overlaps ECC
	Associated pipelines		Overlaps ECC
	Petroleum wells (Dolphin 1, 2 and A3)		Overlap ECC
Perch	Offshore oil and gas platform	Esso Australia Resources Pty Ltd	Overlaps ECC
	Associated pipelines		Overlaps ECC
	Petroleum wells (Perch 1, 2, 3 and 4)		Overlaps ECC
Bullseye 1	Petroleum well	Esso Australia Ltd	Overlaps OWF area
Kyarra 1/ 1A	Petroleum well	Australian Aquitaine Petroleum Pty Ltd	Overlaps ECC
Tommyruff 1	Petroleum well	BHP Petroleum Pty Ltd	Overlaps ECC
Broadbill 1	Petroleum well	Amity Oil NL	Overlaps ECC
Amberjack 1	Petroleum well	BHP Petroleum Pty Ltd	Overlaps ECC
Palmer 1	Petroleum well	Esso Australia Ltd	Overlaps ECC
Wasabi 1	Petroleum well	Santos WA Northwest Pty Ltd	Overlaps ECC
Wyrallah 1	Petroleum well	Australian Aquitaine Petroleum Pty Ltd	4 km south-west of ECC
Blenny 1	Petroleum well	Esso Australia Resources Pty Ltd	3 km north-east of ECC
Tarra 1	Petroleum well	Australian Aquitaine Petroleum Pty Ltd	7 km east of OWF area



0758202_PMAR_R6.aprx/0758202-FIG-PMAR-009-V2.3

Submarine cables

One submarine cable, Basslink HVDC Interconnector and telecoms cable, appears to pass through the OWF area and the ECC (TeleGeography, 2024). Due to the broad scale of the data, the exact location of submarine cables cannot be determined by a desktop preliminary assessment.

4.4.6 TOURISM AND RECREATIONAL FISHERS

Tourism is a key industry in the Gippsland Region, contributing approximately 6% of the region's total economy, and generating direct and indirect employment for almost 11,200 residents, which equates to almost 10% of the region's employment (Business Victoria, 2021).

The Gippsland region is well known for its natural landscapes and tourist attractions, including beaches, rainforests, snowfields, hiking, and riding trails. There are also a number of wineries, restaurants, and festivals that draw visitors and locals to the region throughout the year.

There are several National Parks in the Gippsland region, the following of which are located along the coastline and feature camp sites, walking tracks, and beaches:

- Croajingolong National Park;
- Cape Conran Coastal Park;
- Gippsland Lakes Coastal Park;
- The Lakes National Park;
- Nooramunga Marine and Coastal Park;
- Wilsons Promontory National Park;
- Cape Liptrap Coastal Park; and
- McLoughlins Beach – Seaspray Coastal Reserve.

Additionally, various beaches span the coastline of the Gippsland region, with the notable 'Ninety Mile Beach' recognised as one of the longest beaches in Victoria, spanning around 145 km from Port Albert to Lakes Entrance. Ninety Mile Beach is a popular tourist location, with many visitors engaging in fishing, swimming, walking, and whale and dolphin watching. The waters of Ninety Mile Beach are also recognised as being rich with marine biodiversity, where around 860 species have been discovered living in 10 m^2 of sand, and a notable 187 species in 1 m^2 (VisitVictoria, 2023). There is less recreational and commercial diving offshore given the few habitat features; however, the wrecks (including the SS Glenelg and Magnolia) are dived.

Fishing is also a major attraction for many visitors and local residents alike, with various opportunities for lake, beach fishing and fishing throughout the region, as well as various charter boat and deep-sea fishing businesses that operate in the region. Popular beach fishing locations along the coastline include: Corinella and Western Port; Wonthaggi, Kilcunda and surrounds; Inverloch and surrounds; Venus Bay; Port Welshpool; and Ninety Mile Beach, Woodside Beach, Seaspray, and Golden Beach. Common catches include flathead, snapper, gummy sharks, mullet, salmon, tailor, whiting, and trevally.

Many visitors and local residents also come to the Gippsland coastal region for whale watching between May and November, with vantage points including Wilsons Promontory Marine National Park. There are several wildlife and scenery viewing boat tours that operate in the region, providing opportunities to view whales, dolphins, and seals amongst other local species.

4.4.7 SHIPWRECKS

Maritime Cultural Heritage in Australian waters is listed in the Australian National Shipwrecks Database (**ANSDB**) and Australasian Underwater Cultural Heritage Database (**AUCHD**).

The offshore components of the Referral Area contain four shipwrecks – three in Commonwealth Waters (City of Hobart, Magnolia and one unidentified) and one in Victorian waters (Sarah). Maritime cultural heritage within the Referral Area is discussed in the *Aurora Green Offshore Wind Project: Preliminary Heritage Assessment* (ERM, 2025a).

4.4.8 DEFENCE AND UXO

Defence

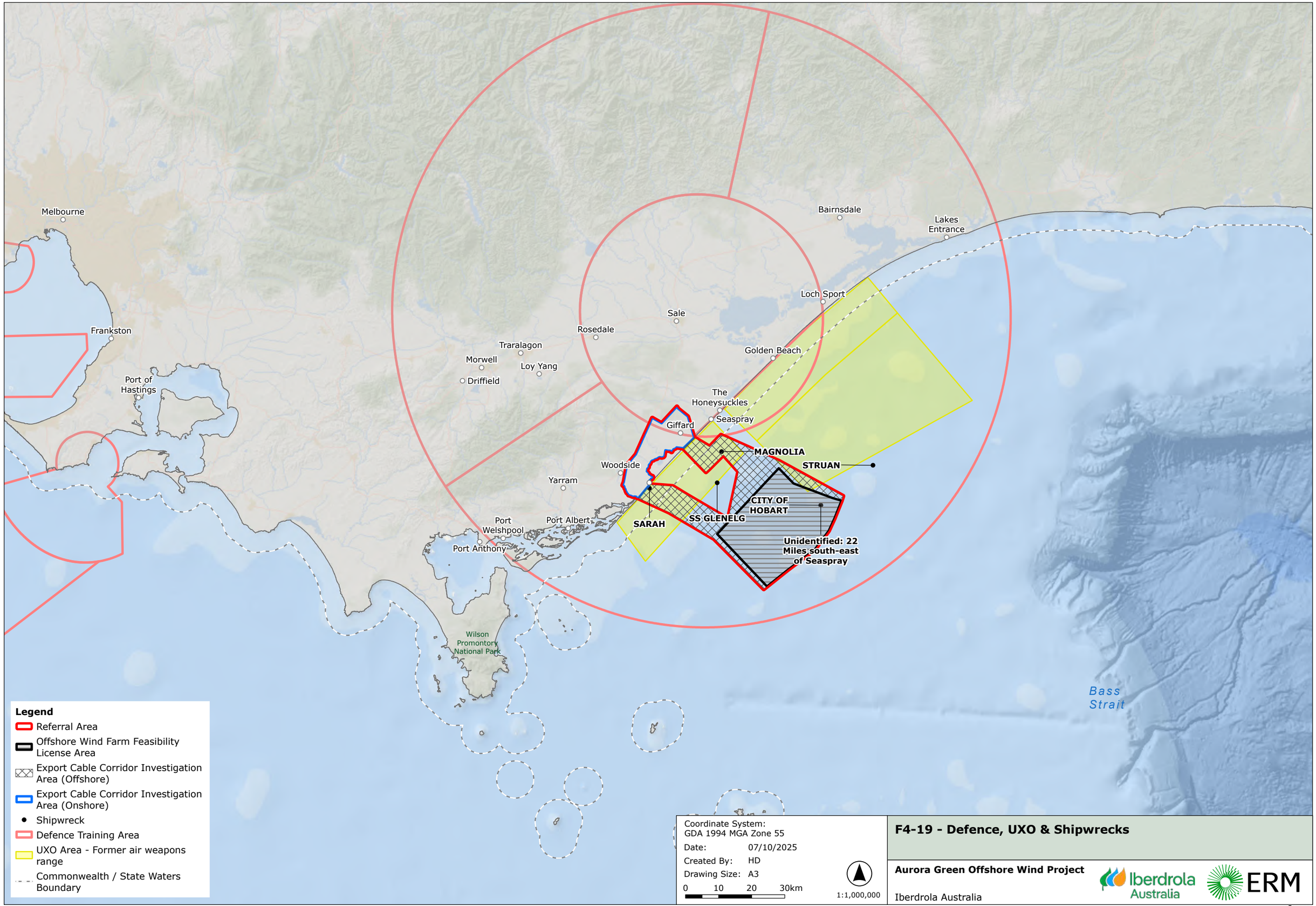
Defence training is primarily concentrated within Defence Practice Areas (**DPAs**), used for maritime/coastal training activities that may pose a significant safety risk to civilian activities were they to coincide. The Referral Area lies within DPA R359F, which is associated with defence activities from the East Sale RAAF Base (Figure 4-19) used for air surveillance, Royal Australian Air Force training and may also support navy vessel and submarine activities on occasion.

Unexploded Ordnance (UXO)

There is the potential for UXO to occur within the Referral Area. The ECC traverses a former WWII air weapons range (364 Giffard). In addition, two former Air Weapons Ranges are adjacent to the north-east portion of the Referral Area, 392 Bass Strait and 393 Seaspray (Navy, 2022; Geoscape Australia, 2022). One UXO site, 364 Giffard, was used as an Air Weapons Range during WWII, (includes Site ID 365) and overlaps the ECC (Figure 4-19).

4.4.9 CIVIL AVIATION

The Referral Area is located near several civil aviation assets. These include regional airports such as Sale, Bairnsdale, and Latrobe Valley, which support both passenger and general aviation services. The area is also in proximity to RAAF Base East Sale, a major military aviation training facility that shares airspace with civil operations. Additionally, the region is covered by air traffic control and radar systems managed by Airservices Australia, which monitor flight paths across Bass Strait and southeastern Victoria.



0758202_PMAR_R6.aprx/0758202-FIG-PMAR-010-V2.3

5. PRELIMINARY ASSESSMENT

A qualitative preliminary assessment of potential environmental effects has been undertaken and which identifies:

- Aspects relevant to Project activities during the different stages of the Project (i.e. Construction, Operation, and Decommissioning), that may result in environmental effects and impact;
- Key environmental effects that may arise from these aspects, and the key receptor groups that may be impacted; and
- Preliminary mitigation measures based on legislation and standard industry practices to manage and reduce the magnitude of the impacts that may occur.

Project aspects include those associated with both planned activities (as per Section 1) and the risk of unplanned events occurring (e.g. vessel strike). The Project aspects and effects are described consistent with the key impact sources and pathways identified in DCCEEW's Guidance on *Key environmental factors for offshore windfarm environmental impact assessment under the EPBC Act 1999* (Commonwealth of Australia, 2023d).

For the purposes of this assessment, it has been assumed that all PMST marine species identified may occur within the Referral Area. Determination of likely presence and habitat utilisation within the Referral Area will be further characterised as part of a future environmental impact assessment (**EIA**) process, informed by baseline surveys.

Due to the preliminary nature of this assessment, cumulative effects have not been considered but will considered in the future EIA.

5.1 PRELIMINARY IMPACT AND RISK ASSESSMENT

Receptor groups that may be impacted by the Project and the key Project aspects/sources of impact they are likely to encounter are identified below in Table 5-1 and Table 5-2. An 'X' denotes the potential for impact from a key Project aspect/source of impact on a receptor group.

TABLE 5-1 KEY PROJECT ASPECTS/SOURCES OF IMPACT AND RECEPTOR GROUPS

	Sources of impact - Key impact pathways (stressors)												
Receptor groups	Underwater noise emissions – injury and behavioural effects	Turbine interactions	Physical presence – barrier effects and displacement of marine fauna	Seabed and/or shoreline disturbance - harm, loss of habitat, displacement	Physical presence – effects on hydro-dynamic and sediment transport processes	Physical presence – socioeconomic: interference/ displacement of existing	Light emissions – behavioural effects	Electro-magnetic field emissions - behavioural effects	Introduction of invasive marine species - Ecosystem disruption, socio-economic disruptions	Vessel interactions – injury and mortality to marine fauna	Routine discharges of Project vessels – changes to water quality	Unplanned discharges: dropped objects and vessel waste– changes to water quality, habitat alterations	Unplanned discharges: fuel / chemical spills of Project vessels– changes to water quality
Marine mammals (listed as threatened, migratory and marine)	X		X		X					X	X	X	X
Fish and sharks (listed threatened, migratory and marine)	X			X	X			X	X	X	X	X	X
Marine turtles (listed threatened, migratory and marine)	X			X	X		X			X	X	X	X
Seabirds (listed threatened, migratory and marine)	X	X	X		X		X				X	X	X
Shorebirds (listed threatened, migratory and marine)		X	X	X	X		X					X	X
Land birds (listed threatened, migratory and marine)		X	X	X			X						
Benthic habitats and biological communities (environment of the Commonwealth marine area)	X			X	X			X	X			X	X

	Sources of impact - Key impact pathways (stressors)												
Marine environmental quality (environment of the Commonwealth marine area)				X							X	X	X
Values of Australian Marine Park management plans	X			X	X				X				X
Other marine users (environment of the Commonwealth marine area)				X	X	X			X				X

5.1.1 UNDERWATER NOISE

Table 5-2 presents an overview of the potential impacts and risks from underwater noise as well as preliminary mitigation measures.

TABLE 5-2 UNDERWATER NOISE AND VIBRATION IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area • ECC
Receptors	• Marine mammals • Marine turtles • Diving/foraging seabirds • Fish and sharks • Benthic habitat and communities • Values of Australian Marine Park management plans
Aspect summary	Sources of underwater noise from project activities include: • Vessel operations (including dynamic positioning (**DP**) thrusters) (all project phases) • Pile driving for foundation installation (construction) • Geophysical survey instruments (e.g. multibeam echosounders, side scan sonar) (construction) • Positioning transponders (construction) • Operating turbines (operation) • UXO clearance (construction)
Potential impacts and risks	

Underwater noise emissions from the sources outlined above have the potential to result in the following impact(s):

- a change in ambient noise
- a change in fauna behaviour
- injury and/or mortality to fauna.

The occurrence and intensity of impacts are highly variable and depend on a range of factors relating to the animal and situation, such as the frequency range and intensity of the noise produced, and the type of acoustic signal.

High magnitude impulsive sound (e.g. from pile driving during foundation installation) has the potential for physical effects (hearing impairment or injury) on some marine fauna at close range. In particular, high accumulated sound exposures may result in temporary or permanent hearing impairment.

Behavioural avoidance and behavioural changes may occur as a result of noise from construction, decommissioning and vessel activities. There is also potential for masking or interference with biologically important sounds (including vocal communication, echolocation, signals and sounds produced by predators or prey).

Item	Relevance
	The Referral Area supports high value habitat for a range of threatened/migratory marine species, including marine mammals, sharks and marine turtles. The Referral Area also provides habitat for fish and shellfish, including commercially valuable species. These species are sensitive to high noise levels generated by pile driving and other project activities (SA DIT 2023; Madsen et al., 2006; Vella et al., 2001; Tidau and Briffa 2016). Marine birds can also be exposed to underwater noise when diving. The degree of noise exposure would depend on the nature of works (e.g. size and depth of piles, piling methods, duration/timing of works, application of mitigation strategies) and local environmental conditions (i.e. bathymetry, physical properties of the water column). Piles would need to be driven deep into the seafloor, which can produce an effects range (hearing impairment or behavioural disturbance/ displacement) many kilometres from the works site (Madsen et al., 2006; SA DIT 2023; Muller et al., 2019). **Marine Mammals** 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. With the implementation of mitigation measures (common place in the offshore wind sector), permanent auditory impairment or injury (**AINJ**) (permanent threshold shift)) of individuals present in the Referral Area is not expected. There may be the potential for behavioural effects and temporary threshold shift (**TTS**) effects to occur during foundation installation and other construction and decommissioning activities (e.g. vessels operating dynamic positioning systems, and thrusters for extended periods of time, cable laying activities, UXO clearance if required). Operational noise is unlikely to have significant effects to marine mammals over large distances, although behavioural effects from noise associated with maintenance vessels and operating wind turbines is possible. However, given relatively low sound levels, significant effects are considered unlikely. Further assessment of potential impacts to specific threatened species of marine mammals is presented in Section 5.2.1 as part of the preliminary assessment of potential significant impacts on MNES. **Turtles** The Recovery Plan for Marine Turtles in Australia (Commonwealth of Australia 2017a) lists noise interference as a threat to marine turtles. Underwater noise from construction (e.g., foundation installation) and decommissioning may result in localised behavioural responses. The implementation of mitigation measures would limit permanent AINJ risks. 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. **Seabirds** Bird species that may dive underwater while foraging include little penguins, gannets, albatrosses, petrels, shearwaters and tern species. While diving, birds could potentially be exposed to underwater noise from construction activities, but their hearing underwater is poorly understood. Wei and Erbe (2024) predicted the region of highest auditory sensitivity in little penguins underwater is approximately 200-6,000 Hz, which is similar to measured underwater noise sensitivity in the Great Cormorant (Larsen et al. 2020). Noise from construction activities, such as pile driving and vessel noise, is therefore within their detectable range of hearing. Sørensen et al. (2020) found Gentoo penguins in a large tank of water showed strong behavioural responses at 120 dB re. 1 µPa when an acoustic stimulus with frequencies between 200 and 6000 Hz was played. Although there are currently no thresholds or assessment criteria for underwater noise impacts to seabirds, with the implementation of mitigation measures during project activities, AINJ of individuals present in the Referral Area is not expected. There may be the potential for behavioural effects and TTS effects to occur during foundation installation and other construction and decommissioning activities. Further assessment of noise levels and ranges is required to understand the extent of potential effects. However, given relatively low sound levels and the temporary nature of birds being exposed while diving underwater, significant effects are considered unlikely.

Item	Relevance
Fish and sharks	
Sharks belong to a group of fish that lack a swim bladder and are therefore insensitive to changes in sound pressure in the water column. However, sharks are able to detect vibrations and the 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 activities that produce high intensity sound such as pile driving during foundation installation. Soft-start mitigation is likely to allow sharks to avoid the immediate area and prevent injury from occurring. It is also noted that underwater noise may indirectly affect the abundance of prey fish species for seabirds in the vicinity of the OWF area, particularly during construction activities, thereby affecting the availability of foraging habitat for seabirds. However, such activities would 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.	
Benthic habitats and communities	
There are knowledge gaps in understanding the potential impacts of underwater noise associated with offshore wind farms on aquatic invertebrates, and benthic habitats and communities in general (Popper et al. 2022). The effects of shipping noise, construction, operation and decommissioning activities have the potential to reduce fitness in benthic organisms and to induce avoidance behaviour in sound-sensitive species, potentially changing population structure and distribution patterns (Dannheim et al. 2020). Impacts may be caused by sound pressure levels, particle motion or vibration associated with construction activities and other operations throughout the development lifecycle (Popper et al. 2022). The mortality of benthic communities as a result of noise emissions from construction activities typically occurs in areas where the seabed would also be impacted (SEER, 2022). While pile driving sounds played to mussels in tanks was shown to enhance larval recruitment in one study (Cervello et al., 2023), behavioural responses in cephalopods (Fewtrell and McCauley 2012) and crustaceans (Payne et al. 2007) to impulsive sounds has also been shown, although these experiments used seismic air guns rather than pile driving noise. Sole et a. (2017) also demonstrated cuttlefish sensitivity to noise using offshore noise-controlled exposure experiments. Noise produced during the wind farm operation is expected to be lower than during construction activities. Limited research exists on specific impacts, but some behavioural and physiological impacts are possible. Cheng et al., (2025) found metabolic and behavioural adaptation in sea cucumber in response to continuous low-frequency sound emulating noise generated by turbine operation, and (Terschek et al., 2025) found low frequency sound can have effects on oxygen consumption rates of benthic crustaceans. Although further research is required regarding impact mechanisms and effects, lifecycle assessments suggest limited adverse impacts to benthic communities as a result of noise emissions from OWF operations (Li et al., 2023).	
Values of Australian Marine Park management plans	
Ninety Mile Beach Marine National Park lies adjacent to the eastern part of the Referral Area. The Project does not overlap with the National Park. The Parks management plan lists a number of benthic habitat types and a high diversity of invertebrates in soft sediments as key natural values. As such the potential impacts outlined above could apply to values being located towards the western end in immediate proximity adjacent to the Referral Area. The Nooramunga Marine and Coastal Park albeit adjacent to the Referral Area.	
Preliminary mitigation measures	
• Marine fauna surveys would be undertaken to better characterise noise-sensitive species that utilise the Referral Area at different times of year. • Acoustic modelling would assess the potential effects of underwater noise, including the use of noise abatement systems such as bubble curtains.	

Item	Relevance
	• Development of and adherence to an agreed Marine Mammal Mitigation Protocol (MMMP) would be undertaken to mitigate potential impacts from underwater noise on marine mammals and fish. • Underwater noise management procedures for impulsive sources (pile driving) would include: – Observation and shutdown zones – Soft-start procedures – Shutdown procedures – Nighttime / low visibility procedures. • Subject to marine fauna survey outcomes and detailed assessment of underwater noise impacts, additional noise monitoring and mitigation would be considered so far as is reasonably practicable, such as: – Passive Acoustic Monitoring (**PAM**) – Engineering solutions – Adaptive management procedures for sensitive species and life stages.

5.1.2 TURBINE INTERACTIONS

Table 5-3 presents an overview of the potential for collision with wind turbines as well as preliminary mitigation measures.

TABLE 5-3 TURBINE INTERACTIONS IMPACTS AND RISKS

Item	Relevance
Project phase	• Operation
Referral Area	• OWF area
Receptors	• Seabirds • Shorebirds • Land birds
Aspect summary	The physical presence of operational wind turbines is known to present a potential collision risk for birds.
Potential impacts and risks	
	Numerous species of seabirds, migratory shorebirds and migratory land birds may be present in the OWF area (refer to Section 4.3.3). Many of these bird species (including albatrosses, petrels, shearwaters) are listed as Vulnerable, Endangered or Critically Endangered. The OWF area would occupy an area that is used by many of these species, either for foraging or migration habitat and the presence of operating turbines presents a risk to these species. Birds that fly in the OWF turbine swept zone are at risk of collision. Collision risk may affect bird populations or disruption to breeding cycles. At this stage, it cannot be determined which species may be impacted or what the magnitude of impacts might be. Baseline bird surveys would be undertaken to better characterise the species that utilise the OWF area at different times of year, including flight paths and flight heights. Studies into avoidance behaviour would also be given due consideration. This information and collision risk modelling would be used to inform a detailed assessment of the potential impacts on populations. **Seabirds**

Item	Relevance
	As described in Section 4.3.3, there are a number of albatross and petrel species that have foraging BIAs that overlap the OWF area and the ECC (and wide areas of the Southern Ocean), therefore there is potential for some foraging seabirds to be at risk of collision. When foraging, large seabirds such as these typically fly close to the surface of the water (Wiemerskirch et al., 2000), suggesting they may forage within the air gap beneath the turbine blades limiting the potential for collision. As discussed previously, further baseline studies and assessment of habitat use in the Referral Area, including flight heights, would be required to understand the behaviours of these species. **Shorebirds** 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 area rather than through the OWF area (DESI, 2023). Whilst the Referral Area does not contain breeding or foraging habitat for shorebirds, the potential for these shorebird species to occur in the OWF area would largely depend on whether they continue migration south from the Australian mainland to locations in the Bass Strait and Tasmania. Therefore, it is possible that individuals may pass through the OWF area and subsequently be at risk of collision (Commonwealth of Australia, 2017b). **Land Birds** Whilst the Referral Area does not contain breeding or foraging habitat for land birds, it is possible that individuals may pass through the OWF area and ECC whilst migrating to their preferred habitat in Tasmania (DELWP, 2016). Such land bird species include the OBP, swift parrot, blue-winged parrot and the white-throated needletail, and may be at risk of collision.
Preliminary mitigation measures	
	• Baseline bird surveys would be conducted to better characterise the species that utilise the OWF area at different times of year, including data on flight paths and flight heights (refer to Section 6). • Collision risk modelling and a collision risk assessment would be undertaken to inform design and mitigation strategies.

5.1.3 PHYSICAL PRESENCE – BARRIER EFFECTS AND DISPLACEMENT OF MARINE FAUNA

Table 5-4 presents an overview of the potential impacts and risks from the physical presence of infrastructure (barrier effects and displacement of marine fauna) as a result of the proposed project, as well as preliminary mitigation measures.

TABLE 5-4 PHYSICAL PRESENCE (BARRIER EFFECTS AND DISPLACEMENT OF MARINE FAUNA) IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation
Referral Area	• OWF area
Receptors	• Seabirds • Shorebirds • Land birds • Marine mammals

Item	Relevance
Aspect summary	The physical presence of the turbines has the potential to have a barrier effect to marine fauna movements resulting in the potential for displacement and a reduction in the area of habitat utilisation.

Potential impacts and risks

The OWF area would occupy an area that is used by many species, either for foraging or migration.

During construction activities, there is a temporary risk of displacement of marine fauna including marine mammals and birds. Short-term habitat loss or the disturbance of breeding and feeding areas from increased vessel traffic and installation activities can cause avoidance behaviours (Exo et al., 2003; Williams et al. 2024). Potential impacts from underwater noise disturbance is assessed in Section 5.1.1.

The presence of operating turbines and the substation platforms may present a potential barrier to marine mammals and birds, and can alter the natural movements and behaviours deterring species from using areas of the marine environment that they currently use (e.g. for breeding, resting or foraging) (Commonwealth of Australia, 2023d).

Birds

The Referral Area supports numerous species of seabirds, migratory shorebirds and migratory land birds (refer to Section 4.3.3). Many of these species (including albatrosses, petrels, shearwaters) are listed as Vulnerable, Endangered or Critically Endangered. Barrier effects include the avoidance or diversion of birds from their normal migratory flight paths resulting in an increase in flight path and migratory distances. The Referral Area overlaps nine foraging BIAs for seabirds and migratory shorebirds. The presence of the OWF area infrastructure may result in displacement of birds from foraging habitat. However, the BIAs are extensive, covering the whole of the SEMR, and the OWF 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. Land birds listed under the EPBC Act as Migratory and with potential to overfly coastal waters may fly through the OWF area but are not expected in significant numbers.

Marine mammals

The physical presence of subsea OWF infrastructure may also impact on the movement and behaviours of marine fauna, including marine mammal species. Impacts of this nature have the potential to impede the recovery of threatened marine mammal species such as pygmy blue whales and southern right whales. The OWF area overlaps a BIA for likely foraging for pygmy blue whales, which includes the majority of the Bass Strait and coastal waters of Tasmania, and a migration BIA for the southern right whale. The presence of the turbines has the potential to impede whale movements leading to behavioural changes, increased migratory distances or displacement from important areas (e.g. BIAs) (Davis et al., 2023).

Preliminary mitigation measures

- Baseline bird surveys would be conducted to better characterise the species that utilise the OWF area at different times of year, including data on flight paths and flight heights (refer to Section 6).
- Marine mammal baseline surveys would be undertaken to better understand the marine mammal species that utilise the Referral Area at different times of year.
- Consider effects on migratory species in project design so far as is reasonably practicable.
- Implement monitoring studies that are informed by the baseline studies and designed to verify predictions made during the assessment.

5.1.4 SEABED AND SHORELINE DISTURBANCE

Table 5-5 presents an overview of the potential impacts and risks from seabed and shoreline disturbances as a result of the proposed project, as well as preliminary mitigation measures.

TABLE 5-5 SEABED AND SHORELINE DISTURBANCE IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Decommissioning Potential impacts to sediment dynamics from the physical presence of project infrastructure during operations is discussed in Section 5.1.5.
Referral Area	• OWF area • ECC
Receptors	• Benthic habitats and communities • Victorian Marine Key Ecological Features • Fish and sharks • Marine turtles • Shorebirds • Land birds • Marine and coastal water quality • Marine and coastal sediment quality • Shoreline and intertidal habitats • Maritime and cultural heritage • Values of Marine Park management plans • Other marine users
Aspect summary	Seabed disturbance would occur due to seabed preparation, the placement of equipment and cable installation/ protection work. This can produce localised plume generation and short-term increases in turbidity and sedimentation typically within the immediate disturbance area. There is a potential for remobilisation of contaminants, if polluted sediments are disturbed and re-enter the water column or are transported to new locations. There is the potential for localised disturbance of P-CASS within the immediate footprint of cable crossing activities.
Potential impacts and risks	

Displacement of sediments during construction and decommissioning activities may result in temporary, localised plumes. Any reduction in water quality within the OWF area and ECC would be temporary (ranging from minutes to a few hours) and is expected to be limited to close proximity of the seabed. Rapid dispersion of suspended sediment is expected due to prevailing hydrodynamic conditions.

The localised and temporary displacement of sediment and subsequent sediment deposition is not likely to result in any lasting change to particle size distribution or the physio-chemical composition of sediment in the Referral Area.

Direct impacts to benthic communities include physical removal and irreversible loss of benthic communities and habitat and localised alteration of the existing hydrodynamic regime within the direct footprint of seabed infrastructure. Sediment plumes also have the potential to impact epifauna as a result of clogging and damage to the feeding and breathing apparatus of filter feeding organisms (Parr et al., 1998) and smothering when the displaced sediments settle. Given the low level and highly localised nature of such deposition, smothering of biota would be limited to the immediate disturbance footprint. Sediment deposition from wider sediment plumes is likely to be naturally reworked into surface sediment layers through bioturbation. While there is some overlap of the referral area with designated Tier 3 Victorian MKEFs, due to the short-term nature of the activity, no lasting impacts to benthic habitats and values of the MKEFs are expected. Seabed surveys will be undertaken to identify and avoid sensitive features as outlined below. There is no

Item	Relevance
	overlap of the Referral Area with sensitive marine habitats including Commonwealth key ecological features or marine protected areas. The physical presence of subsea infrastructures may alter the existing habitat by providing artificial substrate on which sessile organisms may establish. Artificial reef effects include potential attraction of fishes to structures, with localised changes in abundance, distribution and community composition. **Values of Marine Park management plans** Ninety Mile Beach Marine National Park lies adjacent to the eastern part of the Referral Area. The project does not overlap with the National Park. The Parks management plan lists a number of benthic habitat types and a high diversity of invertebrates in soft sediments as key natural values. As such the potential impacts outlined above could apply to values being located towards the western end in immediate proximity adjacent to the Referral Area. Shipwrecks overlapping the Referral Area are shown in Figure 4-19. The placement of infrastructure and associated seabed activities is yet to be confirmed and would be designed to avoid impacts to known maritime and cultural heritage from project activities. **Shoreline and Intertidal Habitats** Saltmarshes are a dominant habitat type throughout the intertidal areas of the Referral Area. Cable crossing activities are unlikely to result in temporary sedimentation of shoreline and intertidal habitats within proximity to activities. CASS and other potential contaminants have the potential to occur within the Onshore Connection Area and shoreline portion of ECC. Sediment disturbance and resuspension in the water column from shore crossing activities may result in the oxidation of sulfides into sulfuric acid, resulting in acidification and dilution of heavy metals. Oxidation may occur over weeks or months following CASS disturbance. Given the shore crossing area may encounter CASS there is a potential for localised changes in water quality. Other contaminants could affect the marine environment resulting in harm to marine life, water quality degradation, and impacts on ecosystem functions.
Preliminary mitigation measures	
	• Geophysical, geotechnical and benthic surveys to identify and avoid sensitive features • Modelling to assess hydrodynamic impacts to seafloor habitats and coastal geomorphological processes • Installation of scour protection on foundations • Setting trigger levels for water quality • Cable route selection to avoid sensitive features where practical • Treatment and management of CASS as per the 'Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management' (Simpson et al., 2018) • Micro-siting and selection of cable routes and shore crossing site to avoid or minimise disturbance to TECs and other sensitive habitats where practical. • Micro-siting of project infrastructure to avoid disturbance to historic shipwrecks and sites of cultural heritage significance.

5.1.5 PHYSICAL PRESENCE – EFFECTS ON HYDRODYNAMICS AND SEDIMENT TRANSPORT PROCESSES

Table 5-6 presents an overview of the potential impacts and risks from the effects on hydrodynamics and sediment transport processes as a result of the physical presence of the infrastructure, as well as preliminary mitigation measures.

TABLE 5-6 PHYSICAL PRESENCE (EFFECTS ON HYDRODYNAMICS AND SEDIMENT TRANSPORT PROCESSES) IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation
Referral Area	• OWF • ECC
Receptors	• Benthic habitats and communities • Marine mammals • Marine turtles • Fish and sharks • Fish communities • Seabirds and shorebirds • Commercial and recreational fisheries • Values of Australian Marine Park management plans
Aspect summary	The OWF would require the installation of the following infrastructure that has potential for effects on hydrodynamics and sediment transport processes: • Offshore turbines • Inter-array cables • Offshore substations • Offshore export cabling
Potential impacts and risks	

The physical presence of OWF infrastructure can change natural patterns of ocean water movement (e.g. currents, waves and mixing dynamics) and the transport of sediments in marine systems (DCCEEW, 2023). The extent and severity of these effects would be influenced by the natural metocean conditions of the area and how they interact with the scale, complexity, design and layout of proposed infrastructure.

The presence of offshore wind turbines and offshore substations can alter local and regional water flow patterns and can modify sediment transport by creating areas of erosion and deposition around the foundation structures. This can lead to changes in the seabed morphology and affect habitats for benthic organisms (Rivier et al., 2016). Changes in ocean water movement as a result of large-scale offshore wind farms has the potential to influence primary production and the broader ecosystem. For example, changes in stratification and sediment concentrations can affect the timing and magnitude of phytoplankton blooms, which are crucial for the marine food web.

Presence of OWF infrastructure, particularly in nearshore areas, may also affect coastal processes that are fundamental to maintaining the ecological character of coastal habitats, including Ramsar wetlands and associated MKEF (e.g. opening and closing of estuarine barrier systems). However, given the distance offshore of the OWF area, impacts to coastal habitats as a result of hydrodynamic alterations from the physical presence of the wind turbines are unlikely.

There are no Ramsar wetlands (including Ramsar associated MKEF) within the ECC or onshore connection area that would be directly impacted by cable lay. Ninety Mile Beach Marine National Park lies adjacent to the eastern part of the offshore ECC. The project does not overlap with the National Park.

Modelling would be required as part of a detailed EIA to assess hydrodynamic impacts and impacts to seafloor habitats and coastal geomorphological processes, including flow on ecological effects. Modelling would be informed by inputs from metocean and geophysical/geotechnical studies, as

Item	Relevance
well as environmental baseline studies in the Referral Area (refer to Section 6). This would be used to inform the OWF area layout and cable routing to avoid or minimise impacts to sensitive areas.	
Preliminary mitigation measures	
• Hydrodynamic and sediment transport modelling would be conducted to inform OWF area design/layout and requirement for scour protection around foundations. • Project infrastructure layout, cable routes and shore crossing sites would be selected to avoid or minimise disturbance to sensitive habitats. • Scour protection would be installed around turbine foundations, as required, to help prevent erosion and sediment displacement. This often involves placing rock or other materials around the base of the turbines to stabilise the seabed.	

5.1.6 PHYSICAL PRESENCE – SOCIOECONOMIC: INTERFERENCE/ DISPLACEMENT OF EXISTING USES

Table 5-7 presents an overview of the potential impacts and risks from interference/ displacement of existing uses within the Referral Area, as well as preliminary mitigation measures.

TABLE 5-7 PHYSICAL PRESENCE (SOCIOECONOMIC: INTERFERENCE/ DISPLACEMENT OF EXISTING USES) IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area • ECC
Receptors	• Shipping and navigation • Commercial fisheries • Recreational fishers and boating • Industry marine users • Defence • Aviation • Radar • Cultural heritage
Aspect summary	The Project would require the construction and ongoing presence of: • Offshore turbines • Inter array cables • Offshore substations • Offshore export cabling It is likely there would some level of temporary exclusion during construction and operation around the turbine foundations, installation and operation vessels and other infrastructure, as needed, in line with safety and other regulatory requirements and industry best practice.

Item	Relevance
	The presence of vessels in the Referral Area could result in interaction with third-party marine users, with a greater number of vessel movements during construction and decommissioning activities compared with operations.

Potential impacts and risks

During construction, operation and decommissioning the presence of infrastructure and project vessels may cause a disruption of other marine users, which may lead to the loss of navigable space available to conduct their activities. The Referral Area is used for various commercial and recreational activities. The worst-case consequence from a loss of access to an area could result in economic losses and/or potential reduction in employment levels.

The Referral Area is located 8 km north of existing shipping routes and commercial vessel density across the OWF area and ECC ranged from one to ten vessels in 2024 per year (Figure 4-17, Section 4.4.3). Potential impacts to shipping activities would likely be a minor interference (i.e. navigational hazard) and temporary, localised displacement/avoidance.

Commercial and recreational fisheries

A review of commercial fisheries found that a number of Commonwealth and Victorian-managed fisheries have historically operated within the Referral Area. Reduced access to commercial fishing areas or effects to the abundance of fisheries species, may impact catch effort of fisheries. Cabling between turbines could potentially create a navigational hazard, which could exclude trawling activity of trawl fishers.

Recreational fishing and tourism activities occur around Ninety Mile Beach and across the Gippsland region. Potential impacts to tourism and recreational activities would likely be a minor interference (i.e. navigational hazard) and temporary, localised displacement/avoidance.

Cultural heritage

The protection of Sea Country will be of importance; further consultation will be required to understand how the project may impact on these values and the significance of the Referral Area. Further assessment of the impacts on cultural heritage values can be found in the *Aurora Green Offshore Windfarm Project: Preliminary Heritage Assessment* (ERM, 2025a).

Defence, aviation and radar

The OWF area and ECC lie within DPA R359F, which is associated with defence activities from the airfield at East Sale. This DPA support Royal Australian Air Force training and may also support navy vessel and submarine activities on occasion.

The presence of the offshore wind turbines has the potential to:

- alter flight paths
- interfere with radar systems.

If inappropriately lit or marked, wind turbines can also pose a hazard to low-level aircraft, particularly at night.

Through consultation and the implementation of proposed mitigation measures, potential impacts from interference/ displacement of existing users are expected to be minor.

Preliminary mitigation measures

- Stakeholder consultation and notifications (including Notices to Mariners).
- Shipping and navigation assessment to document the potential effects on safety of navigation for commercial and recreational vessels.
- Vessels and crew will be compliant with Australian standards and regulations for safety, navigation and communication systems.
- Compliance with the International Regulations for Preventing Collisions at Sea (**COLREG**s)
- Vessels to use required signals, lighting and shapes.
- Proponent commitment to sharing waters with other users to the extent possible.

Item	Relevance
	• Aviation Impact Assessment approved by CASA, Airservices Australia and Department of Defence. • Aviation obstruction lighting on turbines. • Marking of turbines on nautical and aeronautical charts.

5.1.7 LIGHT EMISSIONS

Table 5-8 presents an overview of the potential impacts and risks from artificial lighting as well as preliminary mitigation measures.

TABLE 5-8 ARTIFICIAL LIGHTING IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area • ECC
Receptors	• Marine turtles • Seabirds, shorebirds and land birds Potential light impacts on the visual amenity are addressed in Section 5.1.7.
Aspect summary	Routine light emissions include artificial light sources that may alter the ambient light conditions in an environment. Light emissions during construction, operation and decommissioning would be generated by the following: • Navigation buoys • Vessels • Offshore wind turbines and substations The project vessels would routinely use external lighting to navigate and conduct safe operations at night. External artificial light emissions from the project vessels are typically managed to maintain safe working conditions for crew members. Vessel lighting is also required to communicate the vessel's direction and presence to other marine users (i.e. navigation/warning lights). Wind turbine generators and offshore substations will be equipped with obstruction lights to be visible in the dark for air traffic. Lighting is also required to ensure safe working conditions when accessing and departing each turbine and substation. Lighting is required for safe operation of the offshore infrastructure and project vessels and cannot reasonably be eliminated.
Potential impacts and risks	
Light emissions can affect fauna in two main ways: • Behaviour: Many organisms are adapted to natural levels of lighting and the natural changes associated with the day and night cycle as well as the night-time phase of the moon. Artificial lighting has the potential to create a constant level of light at night that can override these natural levels and cycles. • Orientation: Organisms such as marine turtles and birds may also use lighting from natural sources to orient themselves in a certain direction at night. In instances where an artificial light	

Item	Relevance
	source is brighter than a natural source, the artificial light may act to override natural cues, leading to disorientation or mis-orientation. Light-sensitive marine fauna within the Referral Area include resident and migratory seabirds and shorebirds, land birds and marine turtles. Where there is important habitat for seabirds or turtles within 20 km of a project, the National Light Pollution Guidelines for Wildlife (Commonwealth of Australia, 2023d) recommends that consideration be given as to whether light is likely to have an effect on those species. Lighting from project infrastructure may attract marine turtles and birds, increasing the risk of mortality or changes to feeding behaviour if prey species aggregate around light on water. Behavioural changes reported in marine turtles exposed to increases in artificial lighting can include disorientation and interference during nesting (Pendoley, 2005; Commonwealth of Australia 2023). There are no BIAs for breeding or nesting activities for turtles or birds within the Referral Area. While navigational light emissions from the vessels may be visible to foraging turtles within the Referral Area, significant exposure or changes in ambient light levels are not expected to affect the behaviour of the adult turtle population as adult turtles undertaking migration or foraging activities do not use light cues to guide these behaviours (Witherington and Martin, 2003). The Referral Area is located within the East Asian-Australasian (**EAA**) Flyway, an internationally recognised migratory bird pathway that covers the whole of Australia and its surrounding waters. The migration of marine birds through the EAA Flyway generally occurs at two times of year, northward between March and May and southward between August and November (Bamford et al. 2008; Commonwealth of Australia, 2017b). Artificial light can attract and disorient birds, disrupt foraging and potentially cause injury and/or death through collision with infrastructure (Commonwealth of Australia, 2023). Adult birds are less impacted by artificial lighting than fledglings (Commonwealth of Australia, 2020). Nocturnal birds are at much higher risk of impact (Wies et al., 2001; Commonwealth of Australia, 2023d). With the implementation of mitigation measures as appropriate to the type and location of artificial lighting, impacts are not expected to result in population level impacts to protected bird species.
Preliminary mitigation measures	
	• 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. • 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), so far as is reasonably practicable. • Lighting management plan for cable lay and shoreline crossing activities located near sensitive habitats or populated areas. • Use of infrared aviation lighting to avoid fauna attraction to offshore infrastructure • National Light Pollution Guidelines for Wildlife 2023. • Vessel personnel would receive an induction/training to inform them of the requirements to minimise external artificial lighting.

5.1.8 ELECTRO-MAGNETIC FIELDS

Table 5-9 presents an overview of the potential impacts and risks from electro-magnetic fields (**EMF**) as a result of the proposed project, as well as preliminary mitigation measures.

TABLE 5-9 ELECTRO-MAGNETIC FIELDS IMPACTS AND RISKS

Item	Relevance
Project phase	• Operation
Referral Area	• OWF area • ECC
Receptors	• Benthic invertebrates • Fish and sharks
Aspect summary	The proposed project would use subsea inter-array and export power cables to transmit electricity from the OWF area to shore. The cables will emit EMF that may add to and interact with other sources of electric and magnetic radiation already present in the environment (Offshore Wind Facts, 2024). Subsea power cables are typically grounded and shielded to block electric field emissions to the surrounding environment using conductive sheathing. However, although electric fields are anticipated to be blocked by cable shielding, magnetic fields are not, and may still be emitted into the surrounding environment. The inter-array and export cables would also be buried where site conditions allow, or protected using methods such as concrete mattressing, rock placement and grout bags.
Potential impacts and risks	

Depending on the type and amount of electrical current a cable carries, the cable design, and the proximity of an organism to a cable, EMF emitted by a subsea power cable can have variable effects on marine life that occupy habitats along a cable route.

Potential impacts to benthic invertebrates and fish include:

- Changes in distribution and cover of sessile benthic invertebrates.
- Avoidance behaviour or disruption of communication or navigational signals in fish and invertebrates.
- Alteration to predator – prey dynamics, resulting in highly localised interference with detection of prey and predators for species of sharks sensitive to electric fields.

As some species of fish and invertebrates have been found to detect electro-magnetic fields up to 25 Hz, detection of an EMF from a Direct Current (**DC**) cable operating at a frequency of 10 Hz is possible. The detection of an EMF from an Alternating Current (**AC**) cable, typically operating at a frequency of 60 Hz, is much less likely (SEER, 2022).

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). For example, 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 could be detected by shark species, but the fields would 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. Noting that the Basslink HVDC cable is a 400 kV HVDC cable, the magnitude and extent of effects from the 132 kV inter-array cables and the 275 KV export cables proposed for the OWF area are likely to be less.

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.

EMF produced by subsea cables has the potential to interfere with the navigation and migration of other marine fauna that are understood to perceive and orient to local distortions in the earth's magnetic field, among other cues (such as marine mammals). However, inter-array cables and

Item	Relevance
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 (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 would 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 marine mammals during migration.	
Preliminary mitigation measures	
• EMF desktop study to be undertaken. • Standard measures for cable burial and/or protection.	

5.1.9 INVASIVE MARINE SPECIES

Table 5-10 presents an overview of the potential impacts and risks from the introduction of Invasive Marine Species (**IMS**) as well as preliminary mitigation measures.

TABLE 5-10 INVASIVE MARINE SPECIES IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area • ECC
Receptors	• Benthic habitats and communities • Fish and sharks • Commercial fisheries • Values of Australian Marine Park management plans • Other marine users
Aspect summary	During the Project (predominantly during construction), vessels would be transiting to and from the Referral Area, potentially including traffic mobilising from beyond Australian waters. Construction and maintenance vessels have the potential to introduce IMS to the Referral Area.
Potential impacts and risks	
Benthic habitats and communities, fish and sharks There are two key vectors for introduced marine species, biofouling of the vessel hull, or the release of pests into the marine environment via ballast water exchange (Hewitt and Campbell, 2010). All vessels are subject to some level of marine fouling whereby organisms attach to the vessel hull. IMS could also be present as biofouling on immersible equipment (survey equipment, ROV etc.) and could be translocated to the Referral Area and transferred directly to the seafloor or subsea structures where they could establish. Organisms can also be drawn into ballast tanks during onboarding of ballast water as cargo is loaded or to balance vessels under load. IMS, once established, can be difficult to eradicate and can have serious and permanent consequences within the marine environment, on fisheries productivity, and public health. Shallow water, coastal marine environments are most susceptible to the establishment of invasive populations, with most IMS associated with artificial substrates in disturbed shallow water environments such as ports and harbours (e.g. Glasby et al. 2007; Dafforn et al. 2009a, 2009b).	

Item	Relevance
	Other shallow water, pristine environments also at risk include offshore islands and shoals such as those found in marine parks and reserves. **Values of Australian Marine Park management plans** Ninety Mile Beach Marine National Park lies adjacent to the eastern part of the offshore ECC. The project does not overlap with the National Park. The Parks management plan lists a number of benthic habitat types and a high diversity of invertebrates in soft sediments as key natural values. As such the potential impacts outlined above could apply to national park values being located towards the western end in immediate proximity adjacent to the ECC. The Corner Inlet Marine National Park management plan lists, the internationally significant wetland, open bay habitats, seagrass communities and meadows, a number of benthic habitat types and a high diversity of invertebrates in soft sediments as key natural values. As such the potential impacts outlined above could apply to values in the designated area. **Commercial fisheries and other marine users** The transfer of IMS propagules via anthropogenic dispersal mechanisms and/or stepping-stone dispersal from offshore infrastructure or vessels colonised with IMS, has the potential to affect commercial fishing, resulting in a loss of revenue. Other fishing activities that may be impacted include recreational fishing that is known to occur within the Gippsland region. The quantity of vessels present in the Referral Area would be highest during construction and installation activities and this phase therefore poses a higher risk of introducing IMS. Vessels supporting the activity that remain stationary for greater than seven days, such as specialist construction vessels, may pose a higher risk of IMS introduction. However, the introduction and establishment of IMS is considered highly unlikely, as vessels will adhere to government biosecurity guidelines and management requirements.
Preliminary mitigation measures	
	• Vessels will have an antifouling coating applied that is in accordance with the prescriptions of the International Convention on the Control of Harmful Anti-fouling systems on ships, 2001, and the *Protection of the Sea (Harmful Antifouling Systems) Act 2006* (Cth). • Vessels will comply with the *Commonwealth Biosecurity Act 2015.* • Vessels will have an approved ballast water management plan and valid ballast water management certificate, unless an exemption applies or is obtained. • Vessels operating within Australian seas will manage ballast water discharge using one of the approved methods of management (DAWE 2020). • National Biofouling Management Guidance. • Use of local vessels so far as is reasonably practicable.

5.1.10 VESSEL INTERACTIONS – INJURY AND MORTALITY TO MARINE FAUNA

Table 5-11 presents an overview of the potential impacts and risks from unplanned vessel strike as well as preliminary mitigation measures.

TABLE 5-11 VESSEL INTERACTIONS IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area

Item	Relevance
	• ECC
Receptors	• Marine mammals • Marine turtles • Fish and sharks
Aspect summary	Project vessels operating in the Referral Area may present a potential hazard to marine mammals and other protected marine fauna, such as marine turtles, fish and sharks. Vessel movements can result in collisions between the vessel (hull and propellers) and marine fauna. The factors that contribute to the frequency and severity of impacts due to collisions vary greatly due to vessel type, vessel operation (specific activity, speed), physical environment (e.g. water depth), the type of animal potentially present and their behaviours. Project vessels would typically be stationary or moving at low speeds.
Potential impacts and risks	
Vessel collisions with marine fauna have the potential to occur within the Referral Area. Vessel disturbance is a key threat to a number of migratory and threatened species identified as occurring within the Referral Area, including marine mammals. Collision with marine fauna may result in superficial injury, serious injury that may affect life functions (e.g. movement and reproduction) or mortality. The Referral Area overlaps with BIAs for two marine mammal species (southern right whale and pygmy blue whale) and the white shark. The likelihood of vessel/fauna collision being lethal is influenced by vessel speed—the greater the speed at impact, the greater the risk of mortality (Jensen and Silber, 2004; Laist et al., 2001). Vanderlaan and Taggart (2007) found that the chance of lethal injury to a large whale as a result of a vessel strike increases from about 20% at 8.6 knots to 80% at 15 knots. Project vessels within the Referral Area undertaking construction/installation and IMR activities are likely to be travelling slowly (e.g., <10 knots, and would often be stationary), therefore, the chance of a vessel collision with protected species resulting in a lethal outcome is considered unlikely, as fauna can typically move away from project vessels.	
Preliminary mitigation measures	
• Application of EPBC Regulations 2000, Part 8, Division 8.1 for vessel speeds and approach distances for marine mammals. • Subject to marine fauna survey outcomes additional mitigation would be considered so far as is reasonably practicable, such as adaptive management procedures for sensitive species and life stages.	

5.1.11 ROUTINE DISCHARGES – PROJECT VESSELS

Table 5-12 presents an overview of the potential impacts and risks from routine vessel discharges as well as preliminary mitigation measures.

TABLE 5-12 ROUTINE PROJECT VESSELS DISCHARGES IMPACTS AND RISKS.

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area

Item	Relevance
	• ECC
Receptors	• Water quality • Planktonic communities • Marine mammals • Marine turtles • Fish and sharks • Seabirds and shorebirds
Aspect summary	Routine vessel discharges would include: • sewage, grey water and food waste • deck drainage, bilge water and firefighting foam • cooling water • desalination brine.
Potential impacts and risks	
Discharges from vessels such as food waste, has the potential to change the local water quality for a short period through the addition of a temporary nutrient source, however this nutrient loading would rapidly return to background conditions following dispersion in the water. Potential attraction of some opportunistic marine fauna including fish and seabirds to the area may occur in response to the increased food availability or, indirectly because of attraction of prey species. However, given the small quantities of food waste to be disposed, any attraction is likely to be temporary and localised. Contaminated deck drainage and bilge discharges or failure to treat oily water to suitable Oil in Water (**OIW**) concentrations before discharge, could introduce hazardous substances into the water column, and could result in a reduction in water quality, impacting EPBC-listed species, plankton communities, and other pelagic organisms such as fish species including those targeted by commercial fisheries. Deck drainage, bilge and firefighting foam may contain a range of chemicals, oil, grease and solid material which can have toxicity effects or deplete Dissolved Oxygen (**DO**) in seawater. However, in their diluted form, these are generally considered to have a relatively low toxicity to aquatic species and further dilution of the chemicals in dispersive aquatic environments may then occur before there is any substantial depletion of DO. The key physicochemical stressors that are associated with brine and cooling water discharge include salinity, pH, temperature and chemical toxicity which can cause short-term localised changes in water quality within the surrounding environment. Given the dynamic open ocean environment of the Referral Area (i.e. tides and currents) discharges are expected to rapidly disperse relatively close to the point of discharge and the effects are temporary and highly localised.	
Preliminary mitigation measures	
Any planned discharges will comply with relevant maritime legislation including: • MARPOL requirements • *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and relevant AMSA Marine Orders (Marine Orders 91, 93, 94, 95, 96, 97)	

5.1.12 UNPLANNED DISCHARGES – DROPPED OBJECTS AND VESSEL WASTE

Table 5-13 presents an overview of the potential impacts and risks from unplanned dropped objects or vessel waste discharges as well as preliminary mitigation measures.

TABLE 5-13 UNPLANNED DISCHARGES (DROPPED OBJECTS, VESSEL WASTE) IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area • ECC
Receptors	• Benthic habitats and communities • Water quality • Marine mammals • Marine turtles • Fish and sharks • Seabirds and shorebirds
Aspect summary	Project vessels would generate a variety of solid wastes, including packaging and domestic wastes. There is the potential for solid wastes to be lost overboard to the marine environment, if not managed appropriately. Equipment that is typically windblown or dropped overboard include things such as personal protective equipment and small tools or materials. However, there is also potential for larger equipment to be dropped during the Project, particularly during installation of infrastructure. The spatial extent in which dropped objects can occur is restricted to the Referral Area. The overall footprint of disturbance from a dropped object (including dropped infrastructure) would be minimal and localised. Any larger dropped objects would likely occur within the planned disturbance footprint for the project.
Potential impacts and risks	
The potential impacts of solid wastes accidentally discharged to the marine environment include direct pollution and contamination of the environment and secondary impacts relating to potential contact of marine fauna with wastes. Hazardous solid wastes such as paint cans, oily rags, etc., can cause localised contamination of the water through a release of toxins and chemicals. Given the likely small volumes of any unplanned solid waste discharge, and the occasional nature of the event, these would result in temporary changes to the water quality. The unplanned discharge of solid wastes can result in mortality to fauna, either through contamination or physical injury depending on the nature of the waste. Marine fauna, including fish, seabirds and shorebirds, marine mammals and marine turtles may be impacted through ingestion or entanglement of waste or through exposure to toxic chemicals. Ingestion or entanglement of marine fauna has the potential for physical harm which may limit feeding/foraging behaviours and thus can result in mortalities. In the unlikely event of loss of an object being dropped into the marine environment, potential environmental effects would be limited to localised physical impacts on benthic communities via smothering. In most cases, objects would be able to be recovered and therefore these impacts would also be temporary in nature. However, there may be instances where objects are unable to be recovered due to health and safety, operational constraints or other factors such as the difficulty of recovering dropped objects at depth.	
Preliminary mitigation measures	
• Lifting procedures. • Secure storage of equipment, tools and waste.	

Item	Relevance

	• Recovery of waste where safe to do so.
	• Project vessels compliant with Marine Orders for safe vessel operations:
	  ○ Marine Order 94 (Marine pollution prevention -packaged harmful substances) 2014
	  ○ Marine Order 95 (Pollution prevention -Garbage).

5.1.13 UNPLANNED DISCHARGES – FUEL AND CHEMICAL SPILLS

Table 5-14 presents an overview of the potential impacts and risks from unplanned spills as well as preliminary mitigation measures.

TABLE 5-14 UNPLANNED SPILLS IMPACTS AND RISKS

Item	Relevance
Project phase	• Construction • Operation • Decommissioning
Referral Area	• OWF area • ECC
Receptors	• Water quality • Planktonic communities • Benthic habitats and communities • Shoreline habitats • Marine mammals • Marine turtles • Fish and sharks • Seabirds and shorebirds • Commercial fisheries • Values of Australian Marine Park management plans • Tourism and recreation
Aspect summary	Throughout the life of the Project, project vessels, turbines and facilities use and store a variety of fuels, oils, lubricants, bio-fouling paints and other chemicals. A number of hydrocarbon and chemical spill scenarios have the potential to occur as a result of the Project, including: • Minor deck spills on board the vessels • Failure of hydraulic hoses • Loss of hydrocarbon fuel during bunkering of vessels • Loss of a fuel tank resulting from a vessel collision. The loss of a fuel tank as a result of a vessel collision is considered the worst-case credible spill scenario. The volume of a spill from a vessel collision would depend on the size of vessel and fuel tank capacity. Large hydrocarbon spills from a vessel collision scenario have the potential to result in significant impacts on a regional scale.

Item	Relevance
Potential impacts and risks	

A worst-case scenario of a vessel collision and subsequent surface release of marine diesel oil/marine gas oil (**MDO/MGO**) has the potential to result in:

- changes to water and sediment quality,
- sub-lethal and lethal effects to organisms through surface, entrained, dissolved, and shoreline hydrocarbon exposure,
- pollution and contamination of shoreline habitats and wetlands,
- fouling, injury or mortality of marine fauna,
- fouling, injury or mortality of birds,
- hazard to other vessels,
- fouling of other vessels, fishing equipment,
- impacts on livelihoods (fisheries, aquaculture),
- impacts on social amenity,
- hazard to human health.

Upon release to the marine environment hydrocarbons would disperse through natural physical oceanic processes, such as currents, tides and waves, and photochemical and biological degradation. Therefore, any surface expression is expected to weather and dissipate with time. Exposure to hydrocarbons entrained and dissolved hydrocarbons is typically limited to the upper water column (up to approximately 20 m depth for entrained oil and up to approximately 60 m depth for dissolved aromatic hydrocarbons). Shoreline accumulation may occur depending on the location and extent of a spill plume.

In the event of a worst-case vessel spill, there is potential for hydrocarbons to be present in offshore waters up to several hundred kilometres from the release site, depending on spill volume and local oceanic conditions. There is therefore potential for widespread impacts to marine species, habitats and values of Australian Marine Park management plans. Toxicity of hydrocarbons would be significantly reduced by weathering over such distances, with the volatile and water soluble (often the most toxic) components expected to have dissipated beyond the immediate vicinity of the spill site. Beyond this, effects would be limited to sublethal and behavioural impacts to marine fauna. Given hydrocarbon characteristics, expected rapid weathering, and the mobile transient nature of individuals, an unplanned release is not expected to result in population level impacts to protected marine fauna.

The implementation of legislative and standard control measures for shipping and navigation, maritime communications, simultaneous operations planning and spill prevention and response planning would mitigate these potential impacts. Further control measures would be identified during the Project impact assessment and via the consultation process.

Preliminary mitigation measures

- Compliance with the International Regulations for Preventing Collisions at Sea (**COLREG**s)
- Contract vessels compliant with Marine Orders for safe vessel operations:
  - Marine Order 21 (Safety of navigation and emergency procedures) 2016
  - Marine Order 27 (Safety of navigation and radio equipment) 2016
  - Marine Order 30 (Prevention of Collisions) 2016.
- Compliance with maritime legislation for discharges (e.g. MARPOL)
- Dangerous goods managed in accordance with International Maritime Dangerous Goods (**IMDG**) Code to reduce the risk of an environmental incident, such as an accidental release to sea or unintended chemical reaction.
- Standard hazardous material management measures in accordance with maritime legislation and best practice.
- Shipboard Oil Pollution Emergency Plans (**SOPEP**s).
- Compliance with the National Plan for Maritime Environmental Emergencies.

Item	Relevance
• AHO notified of activities and movements. • Establishment of a safety exclusion zone. • Appropriate storage of chemicals on vessels. • Refuelling/bunkering procedures. • Simultaneous operations management plans.	

5.2 PRELIMINARY ASSESSMENT OF POTENTIAL SIGNIFICANT IMPACTS ON MNES

This section presents a preliminary assessment of potential significant impact to the MNES as identified in Section 4.3.3.

The MNES Significant Impact Guidelines 1.1 (Commonwealth of Australia, 2013a) define a significant impact as "an impact which is important, notable, or of consequence, having regard to its context or intensity". Whether or not an action is likely to have a significant impact depends upon a range of factors including the sensitivity, value, and quality of the environment, which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

Consistent with Commonwealth of Australia 2013a, this assessment considers the application of legislated mitigation and standard industry practice mitigation in Australia when determining the potential for a significant impact to occur. A potential for significant impact determination was made where there is possibility for significant impact to occur even with standard mitigation in place, or if there is scientific uncertainty about impacts that have the potential to be serious or irreversible.

Where potentially significant impacts have been identified, some but not all of the species that have the potential to be significantly impacted have been identified. The collection of additional species data will be required to inform the future EIA to enable a comprehensive assessment.

5.2.1 LISTED THREATENED SPECIES

5.2.1.1 BIRDS

Critically endangered, endangered or vulnerable seabird, shorebird and land bird species that have been identified to occur in the Referral Area are listed in Table 5-15. An assessment of potential impacts and risks from the Project against the significant impact criteria for these species is presented in Table 5-16.

TABLE 5-15 THREATENED BIRD SPECIES

Critically Endangered
Curlew Sandpiper *Calidris ferruginea*
Eastern Curlew *Numenius madagascariensis*
Parrots: Orange-bellied parrot *Neophema chrysogaster, S*wift parrot *Lathamus discolor*
Endangered

Critically Endangered
Petrels: Gould's Petrel *Pterodroma leucoptera leucoptera,* Southern Giant-Petrel *Macronectes giganteus*
Albatrosses: Grey-headed Albatross *Thalassarche chrysostoma,* Northern Royal Albatross *Diomedea sanfordi,* Shy Albatross *Thalassarche cauta*
Nunivak Bar-tailed Godwit *Limosa lapponica baueri,*
Black-tailed Godwit *Limosa limosa*
Lesser Sand Plover *Charadrius mongolus*
Common Greenshank *Tringa nebularia*
Australasian Bittern *Botaurus poiciloptilus*
Australian Painted Snipe *Rostratula australis*
Vulnerable
Petrels: Blue Petrel *Halobaena caerulea,* Northern Giant Petrel *Macronectes halli,* White-bellied Storm-petrel *Fregetta grallaria grallaria,* Fairy Prion (southern) *Pachyptila turtur subantarctica,* Sooty Shearwater *Ardenna grisea*
Albatrosses: Antipodean Albatross *Diomedea antipodensis,* Black-browed Albatross *Thalassarche melanophris,* Buller's Albatross *Thalassarche bulleri,* Campbell Albatross *Thalassarche impavida,* Gibson's Albatross *Diomedea antipodensis gibsoni,* Indian Yellow-nosed Albatross *Thalassarche carteri,* Northern Buller's Albatross *Thalassarche bulleri platei,* Salvin's Albatross *Thalassarche salvini,* Sooty Albatross *Phoebetria fusca,* Southern Royal Albatross *Diomedea epomophora,* Wandering Albatross *Diomedea exulans,* White-capped Albatross *Thalassarche steadi*
Australian Fairy Tern *Sternula nereis nereis*
Little Tern *Sternula albifrons*
Sharp-tailed Sandpiper *Calidris acuminata*
Great Knot *Calidris tenuirostris*
Red Knot *Calidris canutus*
Eastern Hooded Plover *Thinornis cucullatus cucullatus*
Greater Sand Plover *Charadrius leschenaultii*
Grey Plover *Pluvialis squatarola*
Latham's Snipe *Gallinago hardwickii*
Ruddy Turnstone *Arenaria interpres*
Terek Sandpiper *Xenus cinereus*
Blue-winged Parrot *Neophema chrysostoma*
White-throated Needletail *Hirundapus caudacutus*

TABLE 5-16 POTENTIAL IMPACTS TO MNES: THREATENED BIRD SPECIES

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
An action is likely to have a significant impact on a Threatened species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	Key Project aspects that have potential to impact threatened seabirds include 'physical presence of infrastructure – collision with wind turbine, and 'barrier effects and displacement of marine fauna'. Offshore turbines pose collision risks and migration barriers for birds. The impact depends on bird abundance, their use of the site for migration or foraging, typical flight heights, avoidance behaviours, and population sizes. ***Seabirds*** Five Endangered seabird species and eighteen Vulnerable seabird species may occur in the OWF area (Table 5-15). Bird utilisation of waters within the OWF area and in what numbers they might occur is still uncertain for most species. Eight foraging BIAs for seabirds overlap with the OWF area and the whole of the SEMR. Some foraging seabirds may risk collision, but the Endangered species forage broadly in the SEMR, with the OWF area being only a small part of it. Shy Albatross, Grey-headed Albatross and Northern Royal Albatross forage over wide areas of the Southern Ocean, including the Bass Strait. Southern Giant Petrel and Gould's Petrel are also understood to forage over wide areas of this region. Large seabirds such as albatrosses and petrels typically fly close to the surface of the water whilst foraging (Wiemerskirch et al., 2000), therefore, they may often forage within the air gap beneath the turbine blades, limiting the potential for collision. The presence of operating turbines and the substation platforms also present a potential barrier to these species. Presence of OWF infrastructure can alter the natural movements and behaviours of marine fauna or deter species from using areas of the marine environment that they currently use (e.g. for breeding, resting or foraging) (Commonwealth of Australia, 2023d). Based on the assessment of potential impacts to seabirds presented in Section 5.1 and given the threatened status of these species and uncertainties regarding their potential presence in the OWF area, 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 area, would be carried out to inform the detailed impact assessment process.	Potential for significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	Shorebirds Two Critically Endangered shorebird species, six Endangered shorebird species and eight Vulnerable shorebird species may occur within the Referral Area. Shorebirds prefer foraging along shorelines or coastal wetlands over deep waters. Their impact would depend on migration routes through the OWF area. Most shorebirds migrate from the northern hemisphere or south-east Asia, typically traveling to/from the north of the OWF area rather than through it (DESI, 2023). Potential for these shorebird species to occur in the OWF area would largely depend on whether they continue migration south from the Australian mainland to locations in the Bass Strait and Tasmania. 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 area and their risk of collision would be assessed as part of the detailed impact assessment process. Based on the assessment of potential impacts to shorebirds presented in Section 5.1.2 and given shorebirds typically migrate at altitudes above turbine height, their risk from the OWF area will be considered further during the detailed impact assessment process. Given the threatened status of these species and the uncertainties regarding their potential presence in the OWF area and flight behaviours, impacts to these species are conservatively assessed as having the potential for significant impact. ***Land Birds*** Two critically endangered land bird species, the OBP and swift parrot may occur within the Referral Area. The OBP (*Neophema chrysogaster*) migrates from Tasmania to the mainland during autumn. OBPs overwinter within a narrow zone along the coast, historically extending from eastern South Australia to southern NSW. In recent decades this has largely connected to a few locations along the coast west of Port Phillip Bay. The migration back to Tasmania occurs in spring to summer. Non-breeding habitat does not occur within the OWF area but is nearby to the ECC, therefore, the species may occasionally overfly coastal waters. The swift parrot (*Lathamus discolor*) 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 area and be at risk of collision, however as swift parrots are understood to disperse over a broad area, their presence in the OWF area is unlikely. Two vulnerable land bird species, the blue-winged parrot and white-throated needletail, were identified as having the potential for some individuals to fly through the OWF area during migration to Tasmania.	

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	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.	
Reduce the area of occupancy of the species.	The area of occupancy includes areas of available suitable breeding, migration, or foraging habitat within a species' broader extent of occurrence (i.e. range). ***Seabirds*** The listed threatened seabird species forage widely throughout the region and the Referral Area 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. The area that would be occupied by offshore turbines would be negligible by comparison. Although the Referral Area is mapped as a BIA for a number of seabirds, these areas extend across the whole SEMR. 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 Referral Area. A significant reduction in the area of occupancy of threatened seabirds is not expected. Baseline bird surveys would be undertaken to better characterise the species that occur in the OWF area at different times of year. This information and collision risk modelling would be used to inform a detailed assessment of the potential impacts of collision and avoidance on populations. ***Shorebirds*** The listed threatened shorebirds have broad ranges within Australia and these species primarily occur along shorelines and coastal wetlands, though migration through the OWF area may occur. The OWF area represents a very small part of the area occupied by these species. Baseline bird surveys would be undertaken to better characterise the species that occur in the OWF area at different times of year. This information and collision risk modelling would be used to inform a detailed assessment of the potential impacts of collision and avoidance on populations. ***Land Birds*** The OBP is not expected to migrate through the OWF area. The 'probable migration route' for OBPs is located further west in the central Bass Strait and the area of occupancy is unlikely to be reduced by the OWF area. The OWF area may include migration habitat for Swift Parrot but given its wide area of dispersion from Tasmania to the eastern states of Australia, the OWF area is again considered to represent	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	a small proportion of the species total area of occupancy. A significant reduction in total area of occupation is unlikely.	
Fragment an existing population into two or more populations.	All listed species are known to be mobile and occur over large areas. The Referral Area is not located where it would present a complete barrier across a population's distribution or migration route. Therefore, it is unlikely that the Project would result in the fragmentation of an existing population into two or more populations.	Unlikely to have a significant impact
Adversely affect habitat critical to the survival of a species.	***Seabirds*** The National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011-2016 (Commonwealth of Australia 2022) defines breeding and foraging habitats critical for survival. There are no known breeding colonies located near the Referral Area. The nearest known rookeries are located at Cliffy Island (55 km south-west of the OWF area) and supports several seabird breeding colonies. The Recovery Plan describes all waters in Australian jurisdiction south of 25 degrees to be the most critical foraging habitat for albatrosses and petrels. These foraging habitats cover the entire Bass Strait and most of the SEMR, reflecting how mobile the species are and their widespread foraging behaviours. Given the large extent of the areas identified relative to the OWF area, impacts are unlikely to adversely affect habitat critical to the survival of albatrosses and petrels. ***Shorebirds*** According to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b), important habitats in Australia for 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 area and the ECC are not expected to directly or indirectly impact important wetlands, the Project is not expected to adversely impact important habitats for shorebirds. ***Land birds*** The National Recovery Plan for the OBP (Australian Government Department of the Environment 2016) notes that some mapping of habitat critical to the survival of OBPs has been undertaken, however the OWF area and the ECC do not overlap these habitats. Therefore, the Project is not expected to adversely affect any defined habitat critical to the survival of OBPs. The National Recovery Plan for the Swift Parrot (DCCEEW, 2024) identifies a number of critical habitats for the survival of the species, however, is limited to breeding and foraging habitats that do not occur within the Referral Area. Therefore, the Project is not expected to adversely affect any defined critical habitat.	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
Disrupt the breeding cycle of a population.	***Seabirds*** The OWF area and the ECC do not overlap or occur near any breeding BIAs for threatened seabirds. 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 sites are located near the OWF area (nearest rookery located 55 km south-west of OWF area). While collision of some transient, foraging seabirds in the OWF area is possible over the operation phase of the Project, impacts are not expected to be significant enough to disrupt breeding behaviours or breeding cycles of the broader populations. ***Shorebirds*** The OWF area and ECC do not overlap or occur near any breeding BIAs for threatened shorebirds. 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, approaching these wetlands from the north. These species spend most of their time on coastal beaches, in wetlands and in coastal waters that may be adjacent to the ECC. Some species may pass through the OWF area; however, impacts are unlikely to disrupt the breeding cycles of these species' populations. ***Land birds*** The OWF area and ECC do not overlap or occur near any breeding BIAs for threatened land birds. Potential impacts on OBP 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. Therefore, it is unlikely that the Project would 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 future EIA process.	Unlikely to have a significant impact
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	As discussed previously, habitat for threatened 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. Underwater noise may indirectly affect the abundance of prey fish species for seabirds in the vicinity of the OWF area, particularly during the construction phase, potentially decreasing the availability of foraging habitat for seabirds. However, such activities would be localised to the area of construction and are expected to represent a relatively small proportion of available foraging habitat. Any changes to the availability of prey near to construction activities are expected to be small in the context of normal variability in the distribution and abundance of mobile fish species.	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	The area represented by the OWF area represents a very small area in relation to the wider distribution of the other listed species and it is unlikely that habitat would be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that the listed threatened seabird 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 future EIA process. Bird surveys would be conducted to better characterise the species that occur in the OWF area at different times of year. Data from these surveys along with site-specific collision risk modelling would 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.	For an IMS to be harmful to a threatened species, it would need to survive transport to the region (e.g. in vessel ballast water or as biofouling), establish itself within the Referral 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 outlined in Section 5.1.9 in place, it is unlikely that IMS would become established as a result of Project activities.	No significant impact
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1.9, it is unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment and cause a species decline.	No significant impact
Interfere with the recovery of the species.	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. 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 would not interfere substantially with any species. 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 has been identified above, the Project could potentially have some adverse effects on the recovery of threatened bird species. Bird surveys would be conducted to better characterise the species that occur in the OWF area at different times of year. Data from these surveys along with site-specific collision risk modelling would be used to inform a detailed assessment of the potential impacts on populations.	Potential for significant impact

5.2.1.2 MARINE MAMMALS

Critically endangered, endangered or vulnerable marine mammal species that have been identified to occur in the Referral Area are listed in Table 5-17. An assessment of potential impacts and risks from the Project against the significant impact criteria for these species is presented in Table 5-17.

TABLE 5-17 THREATENED MARINE MAMMAL SPECIES

Critically Endangered
N/A
Endangered
Blue Whale *Balaenoptera musculus*
Southern Right Whale *Eubalaena australis*
Vulnerable
Fin Whale *Balaenoptera physalus*
Sei Whale *Balaenoptera borealis*

TABLE 5-18 POTENTIAL IMPACTS TO MNES: THREATENED MARINE MAMMAL SPECIES

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
An action is likely to have a significant impact on a threatened species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	Two endangered marine mammal species, the pygmy blue whale and southern right whale, and two vulnerable marine mammal species, the fin whale and sei whale, have the potential to occur in the Referral Area. The key Project aspect with the potential to impact the population size of listed threatened marine mammals is underwater noise. A discussion of the potential impacts to threatened marine mammals as a result of underwater noise is presented in Section 5.1.1. As described in Section 5.1.1, high magnitude impulsive sound from pile driving during foundation installation and noise produced by other construction and decommissioning activities, including vessel thrusters, has the potential for effects ranging from behavioural effects through to auditory impairment TTS and Permanent Threshold Shift [**PTS**]) or injury where animals are exposed at close range or for extended periods of time. Baseline marine fauna surveys would be carried out to characterise the level of use within and surrounding the OWF area and acoustic modelling would inform the assessment of potential impacts of underwater noise. The implementation of observation and shutdown zones, soft-start procedures and shutdown procedures would reduce the risk of auditory impairment or injury, but behavioural effects and temporary hearing impairment (TTS) are still possible. However, these effects are unlikely to lead to a long-term decrease in the size of threatened marine mammal populations. *Blue whales / pygmy blue whales* Blue whales and pygmy blue whales are seasonal visitors to the region and may be present from approximately November through to May. The OWF area overlaps a foraging BIA for pygmy blue whales, which includes the majority of the Bass Strait and coastal waters of Tasmania, with the BIA identified based on limited direct observations of feeding or through indirect evidence, such as occurrence of krill in close proximity to whales. 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 annual high use area BIAs for foraging are defined. The annual high use areas are located over 300 km west of the OWF area and so no impacts are expected in these areas. A known foraging area BIA is also defined from Cape Otway to Port Phillip Heads and south to King Island but this area is 150 km west of the Referral area and no impacts are expected. Noting that the OWF area 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 area 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.	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	The Conservation Management Plan for the Blue Whale (Commonwealth of Australia 2015c) sets out specific requirements under Action Area A.2, specifically that anthropogenic noise in BIAs will be managed such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area. Associated Guidance on key terms within the Blue Whale Conservation Management Plan (**CMP**) (published by the former Department of Agriculture, Water and the Environment (**DAWE**) in 2021) clarifies that: *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 includes 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. 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 Port Phillip Bay, the potential effects are likely to be minor. However, considering the above policy position of the Blue Whale CMP, potential disturbance of pygmy blue whales within the foraging BIA would potentially constitute 'displacement' during construction and decommissioning activities. Adaptive management measures would be considered as part of the impact assessment to avoid impacts on foraging blue whales along with other sensitive species and life history stages. Operational noise is unlikely to have significant effects on marine mammals over large distances, although behavioural effects from noise associated with maintenance vessels and operating wind turbines, including cumulative effects, is possible. Further assessment of noise levels and ranges is required to understand the extent of potential effects. However, given relatively low sound levels, this is considered unlikely. *Southern right whales* Southern right whales may occur in the Referral Area between approximately April to November, although numbers are likely to be low due to the small subpopulation size. The Referral Area overlaps a Migration BIA and Reproduction BIA (which includes all Victorian 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). Although coastal waters adjacent to	

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	the OWF area and within the ECC do not represent an established aggregation area for breeding or calving southern right whales, 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, over 400 km west of the OWF area. Action Area A2 of the National Recovery Plan for the Southern Right Whale (DCCEEW 2024) requires coastal and offshore development actions to be 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. Action Area A5 also requires Actions within and adjacent to southern right whale BIAs and habitat critical to 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. Potential behavioural and TTS effects may occur due to construction and decommissioning activities (primarily from pile driving of foundations 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 temporary displacement of individuals within the Migration BIA when seasonally present. A range of control options would be considered to prevent disturbance to southern right whale habitat during the breeding and calving season (May-September). These could include timing of activities, use of noise abatement systems for foundation installation activities, increased monitoring and use of marine mammal observers, observation zones and vessel activities shut-down procedures, and limits on vessel speeds. An adaptive management plan will also be developed and informed by underwater noise modelling to determine effects distances, along with in-field monitoring for whales during construction activities. No activities will be undertaken that are inconsistent with a Recovery Plan (EPBC Act) or Action Statement (FFG Act) for threatened whale species. Operational noise is unlikely to have significant effects to marine mammals 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 area to reduce available habitat / area of occupancy long term. However, given relatively low sound levels, this is considered unlikely. *Sei and Fin Whales* 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. Fin whales are also infrequent visitors to the Bass Strait. A limited number of sightings suggests that fin whales may migrate through the OWF area and the ECC, and possibly feed in the region, although numbers are likely to be low. Potential disturbance to these species 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.	

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
Reduce the area of occupancy of the species.	As discussed previously, the key Project aspect with potential to impact the area of occupancy of listed threatened marine mammals is underwater noise. A discussion of the potential impacts to threatened marine mammals as a result of underwater noise is presented in Section 5.1.1. Potential behavioural and TTS effects may occur due to construction/decommissioning activities (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 threatened marine mammal species, namely southern right whales and blue whales / pygmy blue whales, within their migration and reproduction BIAs 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 key mitigation measures will be considered to prevent disturbance to Southern right whale habitat during the breeding and calving season (May-September) and within important foraging habitats for blue whales / pygmy blue whales. These could include timing 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 to determine effects distances, along with in-field monitoring for whales during construction activities. Operational noise is unlikely to have significant effects on 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 area to reduce available habitat/area of occupancy long term. However, given relatively low sound levels, this is considered unlikely. 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 future EIA process. This includes cumulative effects of operating turbines. Further assessment, including baseline marine fauna surveys would be carried out to further characterise the level of use within and surrounding the OWF area and acoustic modelling would inform the assessment of potential impacts of underwater noise. *Sei and Fin Whales* 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 their area of occupancy.	Potential for significant impact
Fragment an existing population into	It is unlikely that the Project would result in the fragmentation of an existing population into two or more populations. All listed threatened marine mammals are known to be mobile and occur over large areas. Underwater noise from construction activities would be temporary and adaptive management mitigation and a range of other key	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
two or more populations.	mitigation measures would be considered to prevent displacement or a barrier to migration through the OWF area and surrounding waters. 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, however the impact assessment in Section 5.1.8 concluded that cable EMFs are expected to have limited effect on cetaceans during migration.	
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of blue whales / pygmy blue whales has been identified or designated by DCCEEW. The annual high use foraging areas for pygmy blue whales are located over 400 km west of the OWF area. Therefore, no significant impacts to habitat critical to the survival of the blue whale is expected. The southern right whale reproduction BIA is considered habitat critical to the survival of the species and includes all Victorian state waters out to 2.5 km from shore. The BIA overlaps the ECC, where the main impacts would be temporary and restricted to installation, maintenance and decommissioning of the export cable. The main established breeding, calving and aggregation area for southern right whales in Victoria is over 400 km west of the OWF area at Logan's Beach, near Warrnambool. As discussed previously, behavioural disturbance to foraging or migration activities from underwater noise 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. Further assessment, including baseline marine fauna surveys would be carried out to further characterise the level of use within and surrounding the OWF area and acoustic modelling would inform the assessment of potential impacts of underwater noise. Results would inform the requirement for additional mitigation to reduce impacts on southern right whales. No habitat critical to the survival of sei whales or fin whales is currently defined in Australia.	Potential for significant impact
Disrupt the breeding cycle of a population.	Breeding and or calving of blue whales / pygmy blue whales is not known to occur near the OWF area or ECC. The primary established southern right whale breeding / calving / aggregation area is located near Warrnambool, approximately 390 km west of the Referral Area. However, the OWF area and the ECC overlap a reproduction BIA for this species. 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 key mitigation measures would be considered to prevent disruption during the breeding and calving season (May-September). Disruption to the breeding cycle of Southern right whales is therefore unlikely.	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	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.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	As discussed above, there is potential for 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 area and is not expected to be affected by its physical presence. EMF produced by the inter-array cables and export cables is unlikely to pose a physical barrier to migration. It is unlikely that habitat would be modified, destroyed, removed, isolated, or the availability or quality of the habitat decreased to the extent that these species are 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 would 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 to have a significant impact
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 threatened species, it would need to survive transport to the region (e.g. in vessel ballast water or as biofouling), establish itself within the Referral 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 outlined in Section 5.1.9 in place, it is unlikely that IMS would become established as a result of Project activities.	No significant impact
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1.9, it is unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment and cause a species decline.	No significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
Interfere with the recovery of the species.	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 populations of these species. As discussed above, underwater noise has been identified as having the potential for disturbance/displacement to small groups or individual whales during construction and decommissioning, which could in turn result in the temporary reduction of area of occupancy of the species within a BIA. However, these localised, temporary disturbances are likely to be small in the context of the broader distributions and habitat utilisation of the two species. 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 are expected to have only localised impacts. With the implementation of key mitigation measures identified in Sections 5.1.11 and 5.1.12, it is unlikely the extent of habitat modification would interfere with the recovery of these species. Vessel interactions (collisions) are 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. There are no adopted Recovery Plans for sei whale or fin whale that set our recovery objectives for these 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 with the recovery of either species.	Unlikely to have a significant impact

5.2.1.3 MARINE TURTLES

Critically endangered, endangered or vulnerable marine turtle species that have been identified to occur in the Referral Area are listed in Table 5-19. An assessment of potential impacts and risks from the Project against the significant impact criteria for these species is presented in Table 5-20.

TABLE 5-19 THREATENED MARINE TURTLE SPECIES

Critically Endangered
N/A
Endangered
Leatherback Turtle *Dermochelys coriacea*
Loggerhead Turtle *Caretta caretta*
Vulnerable
Green Turtle *Chelonia mydas*

TABLE 5-20 POTENTIAL IMPACTS TO MNES: THREATENED MARINE TURTLE SPECIES

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
An action is likely to have a significant impact on a Threatened species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	The northern Bass Strait is a known significant feeding ground for leatherback turtles and has been identified as one of the three largest concentrations of feeding leatherback turtles in Australia. In the Bass Strait, leatherback turtles may congregate in areas where southward flowing warm currents converge with steep bathymetric contours, with most sightings occurring between January and May (Department of Sustainability and Environment, 2009). Loggerhead turtles typically have a tropical distribution and are uncommon in waters off Victoria (Commonwealth of Australia 2017a). Therefore, no impacts on the population are expected. Green turtles are not common in waters off Victoria and only individuals occasionally stray into temperate waters (Commonwealth of Australia 2017a). There is no significant habitat for green turtles in the Bass Strait and therefore, no population level impacts are expected. Underwater noise from construction and decommissioning may result in localised behavioural responses to individuals present in the OWF area. The key mitigation measures identified in Section 5.1.1 would limit the risk of injury or mortality and additional mitigation would also be considered during the future EIA process and incorporated into management plans to further reduce the likelihood of impacts. Short term disturbances to leatherback turtles are not expected to result in a long-term decrease in the size of the east coast population that visits the Bass Strait. The physical presence of the operating OWF is not expected to significantly modify habitat or behaviours to the degree that it impacts leatherback turtles foraging behaviours or distribution in the Bass Strait.	Unlikely to have a significant impact
Reduce the area of occupancy of the species.	Short term disturbances to individuals or groups of marine turtles during the construction and decommissioning phases are not expected to result in significant impacts on the population or broader distribution of foraging activities (i.e., no large-scale displacement of turtles from the Referral Area is expected). The physical presence of the operational OWF is not expected to significantly modify habitat or behaviours to the degree that it impacts marine turtle foraging behaviours or their distribution in the Bass Strait. Therefore, the Project is not expected to reduce the area of occupancy of these species.	Unlikely to have a significant impact
Fragment an existing population	It is highly unlikely that the Project would fragment a marine turtle population. Short term disturbances to individuals or groups of leatherback turtles in the vicinity of construction and decommissioning activities are not expected to result in a long-term decrease in the size of the east coast	No significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
into two or more populations.	population that forages in the Bass Strait. It is not expected that the physical presence of the built OWF would significantly modify habitat or behaviours to the degree that it impacts leatherback turtles foraging behaviours or their distribution in the Bass Strait.	
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 significant impact
Disrupt the breeding cycle of a population.	Leatherback turtles, loggerhead turtles and green turtles all breed and nest in the tropical waters. Juveniles of these species do not venture to the temperate waters of the Bass Strait (Department of Sustainability and Environment, 2009). Therefore, Project activities would not disrupt the breeding cycles of these populations.	No significant impact
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Construction activities, 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.	No significant impact
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 threatened species, it would need to survive transport to the region (e.g. in vessel ballast water or as biofouling), establish itself within the Referral 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 outlined in Section 5.1.9 in place, it is unlikely that IMS would become established as a result of Project activities.	No significant impact
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1.9, it is unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment and result in a species decline.	No significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
Interfere with the recovery of the species.	The Recovery Plan for Marine Turtles in Australia (Commonwealth of Australia 2017a) lists the following threats to marine turtles that are potentially relevant to the Project: • Marine debris: Dropped objects and vessel waste from the Project are estimated to be minimal and localised and are not expected to be significant if they are managed in accordance with the key mitigation measures identified in Section 5.1.12. • Chemical discharges: Routine project vessel discharges and temporary, localised changes in water quality are not expected to pose a significant risk to marine turtles if managed in accordance with the key mitigation measures identified in Section 5.1.11. Unplanned fuel / chemical spills are also highly unlikely given the proposed measures in Section 5.1.13. • Light pollution: Some lighting is already present in the area from shipping traffic, commercial shipping and other vessel activities. Artificial lighting may result in the attraction of prey and adult turtles near vessels during construction, maintenance and decommissioning (Section 5.1.7). Offshore light emissions generated from vessel lighting is not expected to have a discernible effect on foraging turtles. Lighting on vessels would be limited to that required for safe operations. • Habitat modification: The presence of OWF infrastructure may locally alter fish communities but is not expected to alter foraging habitat or the availability of prey for turtles. • Vessel disturbance (collision) – regulation of vessel speeds during construction would decrease the likelihood of a vessel interactions with marine turtles. • Noise interference: As discussed above, short term disturbances to individual leatherback turtles as a result of underwater noise is not expected to result in 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 key mitigation measures outlined in Section 5.1.9, it is unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment. Based on this review of relevant aspects and threats, the Project is unlikely to interfere with the recovery of marine turtle populations.	Unlikely to have a significant impact

5.2.1.4 FISH AND SHARKS

Critically endangered, endangered or vulnerable fish and shark that have been identified to occur in the Referral Area are listed in Table 5-21. An assessment of potential impacts and risks from the Project against the significant impact criteria for these species is presented in Table 5-22.

TABLE 5-21 THREATENED FISH AND SHARK SPECIES IDENTIFIED

Critically Endangered
N/A
Endangered
N/A
Vulnerable
Whale Shark *Rhincodon typus*
White Shark *Carcharodon carcharias*
Australian Grayling *Prototroctes maraena*

TABLE 5-22 POTENTIAL IMPACTS TO MNES: THREATENED FISH AND SHARK SPECIES

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
An action is likely to have a significant impact on a Threatened species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	Three Vulnerable fish species, white shark, whale shark and Australian grayling, have the potential to occur in the OWF area and ECC. The white shark is widely distributed, in the temperate waters of Australia. Breeding (nursery) BIAs for the species extend from Wilsons Promontory to Lakes Entrance and overlaps the OWF area and ECC. Whale sharks are predominantly found in the tropical northern waters of Australia and the OWF area and ECC 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. The Australian grayling spends most of its life in freshwater streams and brackish coastal lagoons, however their newly hatched larval stage is spent in coastal waters until juveniles migrate back into fresh water after approximately 6 months. The key Project aspects and effects identified as relevant to threatened fish species are: • Underwater noise: Localised behavioural effects on fish and sharks as a result of underwater noise produced by construction activities are expected to have limited impacts on the survival of individuals or the population. For white sharks, 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 population although some effects on the distribution of juvenile sharks within the nursery BIA will be considered as part of the EIA process. Underwater noise and vibration may also have limited impacts on grayling larvae. Larvae would 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 area, any localised injury or mortality is expected to be negligible in the context of the wider dispersion of larvae and	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	natural mortality rates and underwater noise is not expected to result in a long-term decrease in the size of the population. • EMF: EMF produced by inter-array and export cables have the potential to interfere with shark movements and their ability to detect prey. It is anticipated that behavioural impacts, would generally be of a lesser degree than when compared to the existing HVDC passing through the OWF area and ECC and barriers to movement are not anticipated. EMF effects are less likely to occur in teleost (bony) fish species such as the Australian grayling. EMF effects are not expected to result in impacts resulting in a long-term decrease in the size of shark populations. • Seabed disturbance: Some minor disturbance to shark behaviour within proximity to seabed disturbance may occur as a result of avoidance and behaviour changes. Due to the short, localised and infrequent duration of benthic disturbance, lasting impacts to threatened sharks are unlikely. 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 increases in suspended sediment in marine waters as a result of construction are not expected to significantly impact the species. • Physical presence: barrier effects and displacement: The creation of artificial habitat associated with construction activities and the presence of subsea infrastructure may result in the attraction of other fish species and prey species in the longer term. There is potential for adverse effects to other species due to changes in biological interactions such as increased competition and predation. 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 future EIA process.	
Reduce the area of occupancy of the species.	Since whale sharks are predominantly found in tropical northern waters of Australia, the species is less likely to occur within the OWF area and ECC, and therefore, impacts from the Project would not reduce the area of occupancy of the species population. Adult grayling do not occupy offshore marine waters, they inhabit freshwater streams and coastal lagoons. The Project is not expected to materially reduce the broad area where grayling larvae may disperse offshore. The physical presence of foundations, artificial habitat creation, and EMF effects are also unlikely to reduce the occupancy of grayling larvae/juveniles in the region. Cable EMF is unlikely to act as a barrier to movements of the Australian grayling. The OWF area and ECC overlap approximately a fifth of the white shark breeding (nursery) BIA along the east coast, and sharks may avoid using this segment of BIA due to underwater noise and seabed disturbance during construction activities (and decommissioning activities to a lesser extent). However, construction/decommissioning disturbances would be temporary.	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	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 future EIA process. The physical presence of foundations, artificial habitat creation, and EMF effects are also unlikely to reduce the occupancy of white sharks in the region. Cable EMF is unlikely to act as a barrier to movements of white sharks. Therefore, it is unlikely that the OWF area would reduce the area of occupancy of the population of this species.	
Fragment an existing population into two or more populations.	It is unlikely that the Project would result in the fragmentation of a population of sharks. Impacts from the OWF area are not expected to present a barrier or limit the movement of sharks, or the dispersion of Australian grayling larvae in the region.	Unlikely to have a significant impact
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of whale sharks is known to occur in Victoria or southern Australia. 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 overlapping OWF area and ECC), 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. Disturbance from underwater noise during construction activities could occur within the white shark nursery BIA. However, impacts are not expected to be significant. 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 future EIA process. 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-cycle, it is not practical to specify habitat that is critical to survival of the species.	Unlikely to have a significant impact
Disrupt the breeding cycle of a population.	The OWF area and ECC overlap the white shark nursey BIA located off the coast of East Gippsland. Underwater noise during construction activities has the potential to induce behavioural disturbance effects. Effects are expected to be short-term and localised. While there is the potential for some disruption to the distribution of juvenile sharks and the nursery BIA during construction activities, impacts are unlikely to be significant. Mortality of Australian grayling larvae may occur during construction (locally) due to pile driving during foundation installation and other construction 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	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	naturally high mortality rates and variability that all zooplankton are subject to, no discernible impacts are expected.	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Noting the potential for disturbance to occur within the white shark nursery BIA, underwater noise from construction activities, the presence of foundations and EMF from inter-array and export cables could temporarily modify or decrease the quality of white shark habitat within the nursery BIA (Section 5.1). 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 future EIA process. It is noted that there is some uncertainty regarding the extent of habitat utilisation within the OWF area, which requires further investigation. Baseline fish surveys and underwater noise impact studies are planned and would inform the future EIA process. 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.	Unlikely to have a significant impact
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 threatened species, it would need to survive transport to the region (e.g. in vessel ballast water or as biofouling), establish itself within the Referral 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 outlined in Section 5.1.9 in place, it is unlikely that IMS would become established as a result of Project activities.	No significant impact
Introduce disease that may cause the species to decline.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1.9, it is unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment and cause a species decline.	No significant impact
Interfere with the recovery of the species.	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 are also recognised, however, habitat modification resulting from the Project is not expected to	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	cause 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 the recovery of the species. 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 the species. Project activities and infrastructure in the marine environment are not expected to impact adult individuals within freshwater rivers, and no significant impacts are expected to larval biomass offshore that would materially affect recovery of the species.	

5.2.2 LISTED MIGRATORY SPECIES

Migratory species that have been identified to occur in the Referral Area are listed in Table 5-23. An assessment of potential impacts and risks from the Project against the significant impact criteria for these species is presented in Table 5-24.

TABLE 5-23 MIGRATORY SPECIES IDENTIFIED

Seabirds
Albatrosses: Grey-headed Albatross *Thalassarche chrysostoma,* Northern Royal Albatross *Diomedea sanfordi,* Shy Albatross *Thalassarche cauta,* Antipodean Albatross *Diomedea antipodensis,* Black-browed Albatross *Thalassarche melanophris,* Buller's Albatross *Thalassarche bulleri,* Campbell Albatross *Thalassarche impavida,* Indian Yellow-nosed Albatross *Thalassarche carteri,* Salvin's Albatross *Thalassarche salvini,* Sooty Albatross *Phoebetria fusca,* Southern Royal Albatross *Diomedea epomophora,* Wandering Albatross *Diomedea exulans,* and White-capped Albatross *Thalassarche steadi*
Petrels: Southern Giant-Petrel *Macronectes giganteus,* and Northern Giant Petrel *Macronectes halli*
Shearwaters: Sooty Shearwater *Ardenna grisea,* and Flesh-footed Shearwater *Ardenna carneipes*
Terns: Little Tern *Sternula albifrons*
Shorebirds
Curlew Sandpiper *Calidris ferruginea*
Eastern Curlew *Numenius madagascariensis*
Common Sandpiper *Actitis hypoleucos*
Pectoral Sandpiper *Calidris melanotos*
Lesser Sand Plover *Charadrius mongolus*
Little Curlew *Numenius minutus*
Common Greenshank *Tringa nebularia*
Black-tailed Godwit *Limosa limosa*
Bar-tailed Godwit *Limosa lapponica*
Nunivak Bar-tailed Godwit *Limosa lapponica baueri*
Pin-tailed Snipe *Gallinago stenura*
Sharp-tailed Sandpiper *Calidris acuminata*
Marsh Sandpiper *Tringa stagnatilis*
Great Knot *Calidris tenuirostris*

Seabirds
Red Knot *Calidris canutus*
Greater Sand Plover *Charadrius leschenaultii*
Double-banded Plover *Charadrius bicinctus*
Oriental Plover *Charadrius veredus*
Pacific Golden Plover *Pluvialis fulva*
Grey Plover *Pluvialis squatarola*
Latham's Snipe *Gallinago hardwickii*
Swinhoe's Snipe *Gallinago megala*
Ruddy Turnstone *Arenaria interpres*
Terek Sandpiper *Xenus cinereus*
Wood Sandpiper *Tringa glareola*
Sanderling *Calidris alba*
Whimbrel *Numenius phaeopus*
Ruff *Calidris pugnax*
Grey-tailed Tattler *Tringa brevipes*
Red-necked Stint *Calidris ruficollis*
Landbirds
Fork-tailed Swift *Apus pacificus*
White-throated Needletail *Hirundapus caudacutus*
Yellow Wagtail *Motacilla flava*
Marine Mammals
Whales: Blue Whale *Balaenoptera musculus,* Southern Right Whale *Eubalaena australis,* Fin Whale *Balaenoptera physalus,* Sei Whale *Balaenoptera borealis,* Pygmy Right Whale *Caperea marginata,* Killer Whale *Orcinus orca,* and Humpback Whale *Megaptera novaeangliae*
Dolphins: Dusky Dolphin *Lagenorhynchus obscurus*
Turtles
Leatherback Turtle *Dermochelys coriacea*

Seabirds
Loggerhead Turtle *Caretta caretta*
Green Turtle *Chelonia mydas*
Fish and Sharks
Whale Shark *Rhincodon typus*
White Shark *Carcharodon carcharias*
Grey Nurse Shark *Carcharias taurus*
Shortfin Mako *Isurus oxyrinchus*
Porbeagle *Lamna nasus*

TABLE 5-24 POTENTIAL IMPACTS TO MNES: MIGRATORY SPECIES

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
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	**Birds** The OWF area and ECC supports numerous species of migratory seabirds (e.g. albatrosses, petrels, and shearwaters), migratory shorebirds (e.g. sandpipers, plovers and godwits) and migratory land birds (e.g. parrots and raptors). Many of these migratory species are also listed as Vulnerable, Endangered or Critically Endangered and potential effects have been assessed in Section 5.1. The Referral Area is used by many of these species, either for foraging or migration purposes and the presence of operating wind turbines presents a potential barrier effect and risk of collision to these species. At this stage, the species that may be impacted and the magnitude of impacts is uncertain. Further assessment, including baseline bird surveys would be carried out to better characterise the species that utilise the Referral Area at various times of the year. This information and collision risk modelling would be used to inform a detailed assessment of the potential impacts on bird populations. The following listed migratory seabird species are noted due to the presence of breeding colonies or other significant habitat in the vicinity of the Referral Area: • Short-tailed Shearwater: Rookeries identified at Seal Island, Notch Island, Rag Island and Cliffy Island (approximately 55 km south-west of the OWF area), and foraging BIA present in waters over the Bass Strait, including in the Referral Area. • Crested Tern: Rookeries identified at Seal Island, Notch Island, Rag Island and Cliffy Island (approximately 44 km south-west of the Referral Area). The following foraging BIAs are also present for listed migratory birds: 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 SEMR, and the Referral 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 impacted. Corner Inlet Ramsar site (directly adjacent to the Referral 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 the most potential to occur within the Referral Area, as they are regular migrants between Victoria, Tasmania, and islands within the Bass Strait. The Gippsland Lakes Ramsar site supports a broad range of ecosystem services/benefits including nationally and internationally threatened wetland species, waterbird breeding and fish spawning sites (BMT WBM, 2011).	Potential for significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	Cultural and socio-economic values are equally diverse, noting the particular importance of the site in a regional context in terms of recreational activities such as boating, recreational fishing and holiday tourism (BMT WBM, 2011). Given the uncertainty about the presence, numbers and behaviours of listed migratory seabirds and shorebirds within the Referral Area, the Project is conservatively assessed as having the potential for significant impact on migratory birds. Land birds listed under the EPBC Act as migratory and with potential to overfly coastal waters include white-throated needletail, yellow wagtail and fork-tailed swift. **Marine mammals** The Referral Area supports seven species of migratory marine mammals, 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 Referral Area. As assessed in Section 5.2.1.2, it is unlikely that BIAs or habitat for these species would be substantially modified, destroyed or impacted. Humpback whales are likely to be present in the Referral area during seasonal migrations from May to November. Underwater noise associated with construction and decommissioning activities has the potential to result in behavioural or TTS effects to small numbers of groups or individuals, and vessel interactions and barrier effects are also possible. With the implementation of mitigation measures outlined in Section 5.1.1 for underwater noise, Section 5.1.3 for barrier effects and Section 5.1.10 for vessel interactions, Project activities and infrastructure are unlikely to substantially modify, destroy or impact humpback whale habitat. **Marine turtles** Three species of migratory turtle may be present in the Referral Area. As assessed in Section 5.1.10 and Section 5.1.7, 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. **Fish** The Referral Area supports five species of migratory sharks: whale shark, white shark, grey nurse shark, porbeagle, and short fin mako. These species are highly mobile, and their habitats are widespread. As assessed for white sharks in Section 4.3.3, there is the potential for disturbance to the white shark breeding BIA during construction of the wind farm, but the Project is not expected to significantly modify or destroy the habitat of this species.	

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	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 Referral 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 5.1.9, it is unlikely that IMS would become established.	No Significant Impact
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	As identified in the assessments above and throughout Section 5.1, there is the potential for disruption to the following groups of listed migratory species: • Seabirds, migratory shorebirds and landbirds (e.g. albatrosses, petrels, and shearwaters), and migratory shorebirds (e.g. sandpipers, plovers and godwits), as a result of operating turbines causing collision, displacement, and/or a barrier to migration, seabed/shoreline disturbance, light emissions and fuel or chemical spills. • Marine mammals, specifically pygmy blue whales, southern right whales and humpback whales, as a result of underwater noise disturbance disrupting breeding, foraging, migration or resting behaviours, barrier effects and displacement of marine fauna, vessel interactions and fuel or chemical spills. • Fish and sharks, specifically white shark as a result of underwater noise within a breeding BIA, physical presence of turbines, seabed and shoreline disturbances, effects on hydrodynamics and sediment transport processes, light emissions, electro-magnetic fields and fuel or chemical spills. With the introduction of best practice management and mitigation measures identified in Section 5.1, impacts are likely to be reduced.	Potential for significant impact

5.2.3 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 5-25 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 5-25 POTENTIAL IMPACTS TO MNES: COMMONWEALTH MARINE AREA

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
An action is likely to have a significant impact on the Commonwealth marine area if there is a real chance or possibility that it will:		
Result in a known or potential pest species becoming established in the Commonwealth marine area.	Given the control measures and adherence to the legislation detailed in Section 5.1.9, it is unlikely that IMS would become established.	No significant impact
Modify, destroy, fragment, isolate or disturb an important or substantial area of habitat such that an adverse impact on marine ecosystem functioning or integrity in a Commonwealth marine area.	Modification, destruction, fragmentation, isolation or disturbance of an important or substantial area of habitat such that an adverse impact on marine ecosystem functioning or integrity occurs is not likely as a result of project activities. Habitat modification and disturbance would be limited to direct disturbance from wind turbine and offshore substation foundations and installation of cabling on the seabed, as well as suspended sediments, sediment deposition and/or scour around installed foundations. Generally, the Referral Area comprise of calcareous gravel, sand, and silt with no overlapping Commonwealth-designated KEFs. Along the ECC, gravel content generally decreases with distance from shore. Saltmarsh is the dominant habitat type in intertidal areas. Coral, mangrove, seagrass and macroalgae communities are not mapped within the Referral Area, however, these habitats do occur along the Victorian coastline to the east and west of the Referral Area. Benthic habitat surveys would be undertaken, and the locations of foundations, cables and other infrastructure would be micro-sited to avoid or minimise disturbance to sensitive habitats and communities.	Unlikely to have a significant impact
Have a substantial adverse effect on a population of a marine species or marine mammals including its life cycle (for example, breeding, feeding, migration behaviour, life expectancy) and spatial distribution.	As identified in the assessments above and throughout Section 5.1, there is the potential for disruption to the following groups of listed fauna groups: • Seabirds, migratory shorebirds and landbirds (e.g. albatrosses, petrels, and shearwaters), and migratory shorebirds (e.g. sandpipers, plovers and godwits), as a result of operating turbines causing collision, displacement, and/or a barrier to migration, seabed/shoreline disturbance, light emissions and fuel or chemical spills. • Marine mammals, specifically pygmy blue whales and southern right whales, as a result of underwater noise disturbance disrupting breeding, foraging, migration or resting behaviours, barrier effects and displacement of marine fauna, vessel interactions and fuel or chemical spills. • Fish and sharks, specifically white shark as a result of underwater noise within a breeding BIA, physical presence of turbines, seabed and shoreline disturbances,	Potential for significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
	effects on hydrodynamics and sediment transport processes, light emissions, electro-magnetic fields and fuel or chemical spills The following BIAs overlap the Referral Area and therefore there is also the potential for disruption to the following species: • White shark breeding (nursing area) BIA • Southern right whale migration and reproduction BIAs • Pygmy blue whale foraging BIA • Foraging BIAs for Black-browed albatross, Bullers albatross, Campbell albatross, Common diving-petrel, Indian yellow-nosed albatross, Short-tailed shearwater, Shy albatross, Wandering albatross, and White-faced storm-petrel. With the introduction of best practice management and mitigation measures identified in Section 5.1, impacts are likely to be reduced.	
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 itself would not generate air emissions. Any air emissions generated would stem from fabrication and construction processes, including vessel engine emissions. These vessel emissions will be regulated according to Australian and international maritime laws, such as MARPOL. It is anticipated that these emissions would not negatively affect ecological integrity, biodiversity, social amenity, or human health. Vessel discharges, the suspension of seabed sediments and a possible unplanned fuel or chemical spill may result in changes to water quality. Any 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]). Given the dynamic open ocean environment of the Referral Area (i.e. tides and currents) discharges are expected to rapidly disperse relatively close to the point of discharge and the effects would be temporary and highly localised. A large-scale spill of hydrocarbons (e.g. from a major vessel accident) has the potential to adversely impact biodiversity, ecological integrity, social amenity or human health, however while these events can occur, they are highly unlikely.	Unlikely to have a significant impact
Result in persistent organic chemicals, heavy metals, or other potentially harmful chemicals accumulating in the marine environment such that biodiversity,	A fuel or chemical spill has the potential to result in persistent organic chemicals, heavy metals, or other potentially harmful chemicals accumulating in the marine environment, and therefore affecting biodiversity, ecological integrity, social amenity or human health. However, this is highly unlikely to occur.	Unlikely to have a significant impact

Significant Impact Criteria	Assessment of Significant Impact	Potential Significance of Impact
ecological integrity, social amenity or human health may be adversely		
Have a substantial adverse impact on heritage values of the Commonwealth marine area, including damage or destruction of an historic shipwreck.	There are four shipwrecks within the Referral Area. Three in Commonwealth Waters (City of Hobart, Magnolia and one unidentified) and one in Victorian waters (Sarah) (refer to Section 4.4.7). The placement of infrastructure and associated seabed activities is yet to be confirmed and would be designed to avoid impacts to known maritime and cultural heritage from Project activities.	Unlikely to have a significant impact

5.2.4 RAMSAR WETLANDS

TABLE 5-26 POTENTIAL IMPACTS TO MNES: RAMSAR WETLANDS

Criteria	Assessment of Significant Impact	Potential Significance of Impact
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:		
Areas of the wetland being destroyed or substantially modified	The Referral Area does not overlap the Corner Inlet Ramsar site, and as such, no direct destruction or modification of the wetland would occur. Project related habitat modification and disturbance would be limited to disturbance at the immediate surrounds of the wind turbines, offshore substation foundation locations, as well as along the installation footprint of cabling on the seabed. The preferred shore-crossing methodology at this early stage is trenchless (pending further environmental and technical investigations). As such, the Project is considered unlikely to result in areas of the wetland being destroyed or substantially modified.	Unlikely to have a significant impact
A substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing,	Project related habitat modification, disturbance or alteration of the seabed would be limited to the immediate surrounds of the wind turbines, offshore substation foundation locations, as well as along the installation footprint of cabling on the seabed. The preferred shore-crossing	No significant impact

Criteria	Assessment of Significant Impact	Potential Significance of Impact
duration and frequency of ground and surface water flows to and within the wetland	methodology at this early stage is trenchless (pending further environmental and technical investigations). The Project is considered unlikely to result in any changes to the volume, timing, duration or frequency of ground and surface flows to or within the wetland. As such, there is no significant impact anticipated.	
The habitat or lifecycle of native species, including invertebrate fauna and fish species, dependant upon the wetland being seriously affected	The Referral Area does not overlap the Corner Inlet Ramsar site, as such no direct impacts on the habitat or lifecycle of native species dependant on the wetland is anticipated. There is the potential for disruption to listed fauna species as a result of underwater noise disturbance from vessel activities, foundation installation, site preparation or cable installation activities. However, these are considered unlikely to affect the lifecycle of marine fauna that is dependent on the Ramsar site, due to the relative short-term nature of the impacts, and the relative distance to the wetland. An accidental spill of hydrocarbons (e.g. from a major vessel accident), associated with project activities has the potential to adversely impact habitat or lifecycle of native species, dependant upon the wetland, however while these events can occur, they are highly unlikely. There is a potential for project activities to introduce IMS to the Referral Area, which could establish and encroach on wetland habitat. However, implementing the control measures and compliance with biosecurity legislation outlined in Section 5.1.9 would make it unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment and seriously affect the habitat or lifecycle of native species, dependant on the wetland.	Unlikely to have a significant impact
A substantial and measurable change 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	Vessel discharges, the suspension of seabed sediments and a possible unplanned fuel or chemical spill may result in changes to water quality. Any planned and unplanned vessel discharges will be managed in accordance with Australian and international maritime legislation (e.g., MARPOL). Given the dynamic open ocean environment of the Referral Area (i.e. tides and currents) discharges and spills are expected to rapidly disperse relatively close to the point of discharge and the effects would be temporary and highly localised. An accidental large-scale spill of hydrocarbons (e.g. from a major vessel accident) associated with project activities has the potential to adversely impact water quality, biodiversity,	Unlikely to have a significant impact

Criteria	Assessment of Significant Impact	Potential Significance of Impact
	ecological integrity, social amenity or human health, however while these events can occur, they are highly unlikely.	
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.	With the control measures and compliance with biosecurity legislation outlined in Section 5.1.9, it is unlikely that pathogens, viruses or other causes of disease would be introduced by Project vessels or equipment and cause a species decline.	Unlikely to have a significant impact

6. PROPOSED STUDY PROGRAM

A summary of proposed baseline field surveys and desktop assessments to support a future EIA is provided in Table 6-1 and Table 6-2 respectively. The study program will be subject to consultation with the regulators and would be provided to inform scoping guidelines for the Project.

TABLE 6-1 PROPOSED MARINE BASELINE FIELD SURVEYS AND TECHNICAL STUDIES

Study	Study Objectives	Potential Methods Being Considered
Metocean	• Characterise the waves, currents and sediment transport within the OWF area for engineering design and EIA purposes.	• Floating light detection and ranging (**LiDAR**) buoy. • Wave buoy. • Seabed frame housing metocean instruments.
Geophysical	• Determine geophysical and properties of seabed. • Analyse data to inform benthic habitat and fish ecology surveys. • Identify areas of potential submerged heritage value (submerged paleo-landforms).	• Side Scan Sonar. • Multi-beam echosounder. • Sub-bottom profiler.
Geotechnical	• Determine geotechnical properties of seabed. • Identify areas of potential submerged heritage value (submerged paleo-landforms).	• Core/ grab samples. • Cone Penetration Test.
Marine water and sediment quality	• Characterise water and sediment quality conditions and variability in the study area.	• Water quality profiling of physio-chemical parameters through the water column. • Collection of water grab samples (from surface and near seabed) and sediment core/grab samples; and laboratory analysis of physical, chemical and biological (biomass) parameters. •
Benthic, epibenthic and intertidal ecology	• Gain a detailed understanding of key sensitive habitats within the study area. • Gather information on epibenthic fauna to characterise benthic habitat and understand potential impacts during construction and operation. • Document intertidal ecology that may be disturbed directly during infrastructure installation or indirectly through changes to coastal processes.	• Autonomous Underwater Vehicle (**AUV**) or ROV transects. • Benthic habitat mapping incorporating geophysical and benthic survey data • Benthic grab samples. • Laboratory identification of infauna. • Intertidal walk over and transect surveys.

Study	Study Objectives	Potential Methods Being Considered
Fish ecology	• Quantify characteristics and spatial/temporal patterns of fish communities • Map and describe ecological constraints (e.g. species of direct fisheries significance) • Provide sufficient resolution to broadly describe fish communities at representative habitat types/depths	• Stereo Baited Remote Underwater Video Systems (**SBRUVS**) surveys. • Mono pelagic BRUVs surveys. • Water samples for eDNA. • White shark survey via the deployment of PAM receivers. • Fisheries catch census.
Marine mammals and other megafauna	• Understand presence/absence, distribution, abundance, timing, movements and habitat use within the study area of marine mammals and other megafauna.	• Visual aerial line transect surveys. • PAM to detect the presence of marine mammals. • Multiple lines of evidence approach to incorporate additional data from digital aerial and vessel-based surveys for seabirds and eDNA water samples.
Seabirds and shorebirds	• Understand presence/absence, distribution, abundance, timing and habitat use within the study area of seabirds, shorebirds and migratory land birds within the study area. • Improve understanding of flight pathways and flight heights.	• Digital aerial surveys and boat-based surveys. • Multiple lines of evidence approach to incorporate additional data from marine mammal visual aerial surveys. • Integration of data from the different baseline survey platforms and Collision Risk Modelling.

TABLE 6-2 PROPOSED DESK-BASED MARINE TECHNICAL STUDIES

Study	Study Objectives	Potential Methods Being Considered
Underwater noise	• Define potential sound source levels associated with key noise-emitting activities during construction and operation, such as foundation installation. • Evaluate sound propagation and extent of potential effects to marine fauna.	• Underwater acoustic modelling to enable the quantification of potential acoustic impacts of project activities on noise sensitive receivers, such as marine mammals.
Bird collision risk study	• Assessment of collision risk for populations of key bird species, incorporating data on flight height distribution and spatial patterns from baseline studies and literature review.	• Collision risk modelling.
Offshore electromagnetic fields	• Characterise the potential EMF of the inter-array and export cables.	• Desktop review and assessment.

Study	Study Objectives	Potential Methods Being Considered
	• Assess the potential for impacts to marine fauna, particularly sharks. • Identify opportunities to avoid and/or mitigate potential adverse effects.	
Coastal processes – marine geology, oceanography and physical processes	• Establish a baseline understanding of the marine • environment, focusing on seabed geology, hydrodynamic and wave regime in the Referral Area. • 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.	• Desktop review. • Compile and synthesize site-specific geophysical, geological, and oceanographic data. • Numerical modelling.
Aviation Impact Assessment	• Assessment of potential effects from the project to aviation, radar and air traffic control. • Identification of appropriate risk mitigation strategies.	• Desktop review. • Consultation with CASA and Department of Defence during the preparation of the Aviation Impact Assessment.
Shipping and Navigation Assessment	• Understand the navigation pathways and aggregation areas such as ports in the Gippsland area. • Assessment of the potential effects on safety of navigation for commercial and recreational vessels. • Document how identified navigational hazards would be minimized and not pose a safety risk to other marine users.	• Desktop review. • Shipping and navigation assessment and collision risk modelling. • Ongoing consultation with AMSA, DTP and regional port authorities.
Commercial Fisheries	• Characterisation of commercial and recreational fishing activities within the Referral Area. • Assessment of potential effects from project activities on existing fisheries.	• Desktop review. • Data collection on fisheries locations, effort and type. • Consultation with Commonwealth and State fisheries agencies, industry associations and other relevant fisheries stakeholders.
Social Impact Assessment	• Identification of socio-economic uses within the marine environment. • Assessment of potential social impacts.	• Stakeholder consultation. • Desktop assessment.

7. CONCLUSION

A preliminary assessment of potential environmental impacts has been carried out to inform Project referrals under Commonwealth and Victorian legislation, environmental approvals and project development processes. The assessment indicates the Project could potentially impact on sensitive receptors in the marine environment.

Commonwealth Matters

The following MNES were identified as being relevant to the marine portion of the Referral Area:

- Fifty-five listed threatened species (4 critically endangered, 15 endangered, 36 vulnerable)
- Seventy-two listed migratory species
- The Commonwealth marine area

The preliminary assessment found that there is potential for the Project to have a significant impact on listed threatened and migratory species, including listed birds, marine mammals and fish and shark species; and the Commonwealth marine area.

The Corner Inlet Ramsar site is located to the south-west, adjacent to the Referral Area. It has been assessed as unlikely that the Project would have a significant impact on this wetland.

Victorian Matters

The preliminary assessment has considered the following receptors, values and protected matters in Victoria:

- Species listed as threatened under the FFG Act with a likelihood to occur in the Referral Area.
- The health and biodiversity of marine ecosystems, including protected areas such as marine national parks, coastal parks and important wetlands located in proximity to the Referral Area
- Other marine users.

The preliminary assessment found that there is potential for a total of 49 FFG Act listed species to occur in the Referral Area, many of which are also protected under the EPBC Act.

The assessment found that there is potential for the Project to impact listed threatened species, including threatened birds, marine mammal, fish and shark species.

The project also has the potential to impact other marine users, including commercial and recreational fisheries, boating, aviation and defence.

Potential effects on Victorian matters would be further assessed and impacts addressed through the detailed assessment process under the EE Act, noting that there is some overlap of matters protected under both Commonwealth and Victorian legislation, and many of these Victorian matters would also be addressed via the EPBC process.

Overall, it is anticipated that the potential for significant impacts in the marine environment is primarily related to the project activities proposed in the offshore wind farm area, located in Commonwealth waters between 25 km and 50 km off the coast of Gippsland.

Project activities occurring within Victorian waters are mostly related to the installation of export cable infrastructure, which is anticipated to have a low potential for significant impact.

Proposed Marine Environmental Studies

There are currently uncertainties regarding species presence and habitat in the Referral Area. To ensure a robust assessment of impacts can be undertaken, a number of marine baseline field surveys are proposed, with some already underway. These include:

- Metocean monitoring;
- Geophysical and Geotechnical site investigation;
- Marine water and sediment quality sampling;
- Benthic, epibenthic and intertidal ecology surveys;
- Fish ecology surveys;
- Marine mammals and other megafauna surveys; and
- Seabirds and shorebirds surveys.

Data gathered from baseline surveys and modelling studies will underpin the Project impact assessment, allowing for a robust evaluation of effects on environmental sensitivities, species and habitats. This assessment will inform mitigation strategies and control measures to ensure that potential adverse impacts are avoided and minimised so far as is reasonably practicable.

8. REFERENCES

Agler, B.A., R.L. Schooley, S.F. Frohock, S.K. Katona & I.E. Seipt (1993). Reproduction of photographically identified fin whales, *Balaenoptera physalus*, from the Gulf of Maine. *Journal of Mammology*. 74:577-587

Aguilar, A. (2009). Fin whale Balaenoptera physalus. In: Perrin, W.F., B. Würsig & J.G.M. Thewissen, eds. *Encyclopedia of marine mammals 2nd Edition*. Page(s) 433-437. Academic Press: Amsterdam.

Atlantis Fisheries Consulting Group, 2024. Commercial Fisheries Study – Aurora Green. Prepared for Iberdrola Australia.

Atlas of Living Australia [ALA]. 2025. Althenia marina. https://bie.ala.org.au/species/https://id.biodiversity.org.au/taxon/apni/51294731#tab_recordsView (Accessed 26/02/2025).

Bamford, M., Watkins, D., Bancroft, W., Tischler, G. and Wahl, J., 2008. Migratory shorebirds of the East Asian-Australasian Flyway: population estimates and internationally important sites. Wetlands International – Oceania. Canberra, Australia.

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.

Barrett, G., A. Silcocks, S. Barry, R. Cunningham & R. Poulter (2003). *The New Atlas of Australian Birds*. Melbourne, Victoria: Birds Australia.

Barton, J., Pope, A. and Howe, S. (2012) Marine Natural Values Study Vol 2: Marine Protected Areas of the Victorian Embayments Bioregion, Part 2 Western Port Bay & Corner Inlet. Parks Victoria Technical Series No. 78. Parks Victoria, Melbourne

Blakers, M., S.J.J.F. Davies & P.N. Reilly (1984). *The Atlas of Australian Birds*. Melbourne, Victoria: Melbourne University Press.

BMT WBM. (2011). Ecological Character Description of the Gippsland Lakes Ramsar Site – Final Report. Prepared for the Australian Government Department of Sustainability, Environment, Water, Population and Communities. Canberra.

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.

Business Victoria, 2021. Tourism and Events – Economic Data. Department of Jobs, Skills Industry and Regions. Victoria State Government. Available at: https://tourism.vic.gov.au/research-and-insights/economic-data#:~:text=In%202022%2D23%3A,increase%20compared%20to%202021%2D22.

Butler, A., Althaus, F., Furlani, D. and Ridgway, K., 2002. Assessment of the Conservation Values of the Bonney Upwelling Area: A Component of the Commonwealth Marine

Conservation Program 2002-2004: Report to the Environment Australia. CSIRO Marine Research [Internet]. Available from http://www.environment.gov.au/coasts/mpa/publications/pubs/conservation-assessment-bonney.pdf

Carlton J.T., 1996. Pattern, process, and prediction in marine invasion ecology. *Biological Conservation.*

Cervello, G., Olivier, F., Chauvaud, L., Winkler, G., Mathias, D., Juanes, F. & Tremblay, R. 2023. Impact of anthropogenic sounds (pile driving, drilling and vessels) on the development of model species involved in marine biofouling. Frontiers in Marine Science 10.

Chantler, P. (1999). Apodidae (swifts) species accounts. In: del Hoyo, J., A. Elliott & J. Sargatal, eds. Handbook of the Birds of the World. Volume 5. Barn-owls to Hummingbirds. Page(s) 419-457. Barcelona: Lynx Edicions.

Cheng, X., Gao, Z., Liu, S., Hu, Y., Li, W., Zhang, L. and Ru, X., 2025. Characteristic noise of offshore wind turbine impacts the behavior and muscle physiology of sea cucumber *Apostichopus japonicus, Marine Pollution Bulletin.* 215(117902).

Commonwealth of Australia [CoA], 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/nes-guidelines_1.pdf. Accessed 17 Feburary 2025.

Commonwealth of Australia [CoA], 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 [CoA], 2015a. South-east marine region profile: A description of the ecosystems, conservation values and uses of the South-east Marine Region. Australian Government, Department of the Environment. https://www.agriculture.gov.au/sites/default/files/documents/south-east-marine-region-profile.pdf (Accessed 25/02/2025)

Commonwealth of Australia [CoA], 2015b. Wildlife Conservation Plan for Migratory Shorebirds. Department of the Environment 2015.

Commonwealth of Australia [CoA], 2015c. Conservation Management Plan for the Blue Whale – A Recovery Plan under the Environmental Protection and Biodiversity Conservation Act 1999, Department of the Environment 2015.

Commonwealth of Australia [CoA]. 2017a Recovery plan for marine turtles in Australia. Commonwealth of Australia. 154 pages.

Commonwealth of Australia [CoA], 2017b. Celebrating Australia's Migratory Waterbirds and their Habitats – Showcasing Australia's Flyway Site Network. Department of the Environment, 2017.

Commonwealth of Australia [CoA], 2019. National Recovery Plan for the Swift Parrot (*Lathamus discolor*). Commonwealth of Australia 2019.

Commonwealth of Australia [CoA], 2020. National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds. Department of Environment and Energy 2020.

Commonwealth of Australia [CoA], 2022. National Recovery Plan for albatrosses and petrels. Department of Biodiversity, Conservation and Attractions.

Commonwealth of Australia [CoA], 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.

Dafforn, K.A., Glasby, T.M. and Johnston, E.L., 2009a. Links between estuarine condition and spatial distributions of marine invaders. *Diversity Distribution*. 15. 807-821.

Dafforn, K.A., 2009. Anthropogenic modification of estuaries: disturbance and artificial structures influence marine invasions. Ph.D. Thesis, University of New South Wales, Sydney.

Dement'ev, G.P. and Gladkov, N.A. (1951). *Birds of the Soviet Union. Volume 1*. Jerusalem: Israel Program for Scientific Translations (1969).

Department of Environment, Law, Water and Planning [DELWP], 2017. Southern Right Whale. Our Wildlife Fact Sheet [website]. The State of Victoria. Available from: https://www.wildlife.vic.gov.au/__data/assets/pdf_file/0021/90750/Southern-Right-Whale.pdf

Department of Agriculture, Water and the Environment [DAWE], 2021. Threatened ecological communities [website]. Australian Government, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/communities, accessed 02 March 2022.

Department of Climate Change, Energy, the Environment and Water [DCCEEW]. 2016. National Recovery Plan for the Orange-bellied Parrot, *Neophema chrysogaster*. Australian Government Department of the Environment, Canberra.

Department of Climate Change, Energy, the Environment and Water [DCCEEW]. 2023. 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.

Department of Climate Change, Energy, the Environment, and Water [DCCEEW]. 2023b. National Light Pollution Guidelines for Wildlife, Department of Climate Change, Energy, the Environment and Water, Canberra, May. CC BY 4.0.

Department of Climate Change, Energy, the Environment and Water [DCCEEW]. 2024. National Recovery Plan for the Southern Right Whale, Department of Climate Change, Energy, the Environment and Water, Canberra.

Department of Climate Change, Energy, the Environment and Water [DCCEEW]. 2024. National Recovery Plan for the Swift Parrot, Department of Climate Change, Energy, the Environment and Water, Canberra.

Department of Climate Change, Energy, the Environment and Water [DCCEEW]. 2021. *Biologically important areas of regionally significant marine species,* https://www.dcceew.gov.au/environment/marine/marine-species/bias, accessed 23 January 2023.

Department of Energy Environment and Climate Action [DEECA], 2025. Victoria's Framework for Identifying Marine Key Ecological Features (first edition). Available at: Marine Key Ecological Features

Department of Environment [DoE], 2015. South-east marine region profile – A description of the ecosystems, conservation values and uses of the South-east Marine Region. South-east marine region profile: A description of the ecosystems, conservation values and uses of the South-east Marine Region

Department of Environment, Land, Water and Planning [DELWP]. 2016. National Recovery Plan for the Orange-bellied Parrot Neophema chrysogaster. Australian Government, Canberra.

Department of Environment, Tourism, Science and Innovation, Queensland [DETSI], 2023 East Asian—Australasian Flyway, Wetland*Info* website. Available at: https://wetlandinfo.des.qld.gov.au/wetlands/ecology/components/biota/fauna/fauna-taxon/birds/eaa-flyway.html

Department of Fisheries [DoF]. 2011. Fisheries Fact Sheet: Seagrasses. Government of Western Australia, Department of Fisheries, viewed 18 December 2024, https://www.fish.wa.gov.au/documents/recreational_fishing/fact_sheets/fact_sheet_seagrasses.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.

Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC] 2011. National recovery plan for threatened albatrosses and giant petrels 2011-2016, Commonwealth of Australia, Hobart

Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC] 2012. Conservation Management Plan for the Southern Right Whale. A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999, 2011–2021

Department of the Environment, Water, Heritage and the Arts [DEWHA], 2008. The South-west Marine Bioregional Plan, Bioregional Profile – A description of the ecosystems, conservation values and uses of the North-west Marine Region. Australian Government.

Department of the Environment, Water, Heritage and the Arts [DEWHA], 2010. Draft Recovery Plan for the White Shark (Carcharodon carcharias). Canberra, ACT: Australian Government. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/pubs/white-shark-draft-recovery-plan.pdf. (dcceew.gov.au/search?search_api_fulltext=white shark draft recovery plan.pdf)

Department of Primary Industries (DPI), 2006. Primefacts: Australian grayling *Prototroctes maraena.* Available from: https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/635348/australian-grayling-prototroctes-maraena.pdf

Department of Environment and Primary Industries (DEPI), 2013. Corner Inlet Ramsar Site Boundary Description Technical Report. Department of Environment and Primary Industries, East Melbourne, Victoria.

Department of Transport and Planning (DTP), 2023. Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978, Victoria

Emison, W.B., Beardsell C.M., Norman, F.I., Loyn, R.H. 1987. *Atlas of Victorian Birds*. Department of Conservation Forests and Lands and the Royal Australasian Ornithologists Union, Melbourne.

Environment Australia. 2002. *NON-CURRENT* White Shark (Carcharodon carcharias) Recovery Plan. Available from: http://www.environment.gov.au/coasts/publications/gwshark-plan/index.html. In effect under the EPBC Act from 12-Sep-2002. Ceased to be in effect under the EPBC Act from 06-Aug-2013.

ERM 2025a. Aurora Green Offshore Wind Project: Preliminary Heritage Assessment. Prepared for Iberdrola. 8 August 2025.

ERM 2025b. Aurora Green Offshore Wind Project: Preliminary Terrestrial Ecological Assessment. Prepared for Iberdrola. 20 August 2025.

Ferreira, L.C., Jenner, C., Jenner, M. *et al.* Predicting suitable habitats for foraging and migration in Eastern Indian Ocean pygmy blue whales from satellite tracking data. *Mov Ecol* **12**, 42 (2024). https://doi.org/10.1186/s40462-024-00481-x

Geoscape Australia, 2022. *Where is UXO*. Available at: https://www.whereisuxo.org.au/

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., Morrice, M.G., Page, B. and Pirzl, R., 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., Pirzl, R., Morrice, M.G. and Lawton, K., 2015. Cetacean diversity of the continental shelf and slope off southern Australia. *The Journal of Wildlife Management*. 79, 4. 672-681.

Glasby, T.M., Connell, S.D., Holloway, G.M. and Hewitt, C.L., 2007. Nonindigenous biota on artificial structures: could habitat creation facilitate biological invasions? *Marine Biology*. 151. 887-895.

Gunaikurnai Land and Waters Aboriginal Corporation [GLaWAC], 2023. Our Country. Available at: https://gunaikurnai.org/our-country/

Harrison, P.L., 1999. Oil pollutants inhibit fertilization and larval settlement in the scleractinian reef coral *Acropora tenuis* from the Great Barrier Reef, Australia. Sources, Fates and Consequences of Pollutants in the Great Barrier Reef and Torres Strait, GBRMPA: 11-12.

Hays, G.C., Morrice, M. and Tromp, J.J., 2023. A review of the importance of south-east Australian waters as a global hotspot for leatherback turtle foraging and entanglement threat in fisheries. *Marine Biology*, *170*(6), p.74.

Heislers, S., & Parry, Gregory. 2007. Species diversity and composition of benthic infaunal communities found in Marine National Parks along the outer Victorian coast.

Hewitt, N., Klenk, N., Smith, A.L., Bazely, D.R., Yan, N., Wood, S., MacLellan, J.I., Lipsig-Mumme, C. and Henriques, I., 2011. Taking stock of the assisted migration debate. *Biological Conservation.* 144, 11. 2560-2572.

Higgins, P.J. (ed.) (1999). *Handbook of Australian, New Zealand and Antarctic Birds. Volume Four - Parrots to Dollarbird*. Melbourne: Oxford University Press.

Hobday, A.J., Okey, T.A., Poloczanska, E.S., Kunz, T.J. and Richardson, A.J., 2006. Impacts of Climate Change on Australian Marine Life: Part C Literature Review. CSIRO Marine and Atmospheric Research. https://www.researchgate.net/publication/228552665_Impacts_of_climate_change_on_Australian_marine_life (Accessed 25/02/2025)

Horwood, J.W. 1987. Population Biology, ecology and management. The Sei Whale. Croom Helm, New York.

Hosack GR and Dambacher JM. 2012. Ecological Indicators for the Exclusive Economic Zone of Australia's South East Marine Region. A report prepared for the Australian Government Department of Sustainability, Environment, Water, Population and Communities. CSIRO Wealth from Oceans Flagship, Hobart.

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-MMPATF. 2022. South Eastern Australian and Tasmanian Coast to Slope IMMA Factsheet. IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force, 2022.

Jensen, A. and Silber, G., 2004. Large whale ship strike database (NOAA Technical Memorandum No. NMFS-OPR). National Marine Fisheries Service, Silver Spring.

Jitts HR. 1965. The summer characteristics of primary productivity in the Tasman and Coral Seas. Australian Journal of Marine and Freshwater Research, 16:151-162

Kato, H., Bannister, J., Burton, C., Ljungblad, D., Matsuoka, K. and Shimada, H., 1996. Report on the Japan/IWS Blue Whale Cruise 1995-96 off the southern coast of Australia. Report SC/48/SH9. International Whaling Commission Scientific Committee, Cambridge.

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).

Kennedy, D.M., Thom, B., Gell, R. and Rosengren, N.J., 2024. Coastal geomorphology and geology of the Gippsland Lakes region: a review and future directions. *Proceedings of the Royal Society of Victoria*. 136(1).

Kunhold, W.W., Everich, D., Stageman, J.J., Lake, J. and Wolke, R.E., 1978. Effects of Low Levels of Hydrocarbons on Embryonic Larval and Adult Winter Flounder (*Pseduopleuronectes americanus*), *Proceedings of the Conference on Assessment of Ecological Impacts of Oil Spills.* American Institute of Biological Sciences.

Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M., 2001. Collisions between ships and whales. Marine Mammal Science 17, 35–75.

Larsen, O.N., Wahlberg, M. and Christensen-Dalsgaard, J. 2020. Amphibious hearing in a diving bird, the great cormorant (*Phalacrocorax carbo sinensis*). *J. Exp. Biol*. 223, jeb217265. (doi:10.1242/jeb.217265)

Laws, R.M. 1961. Reproduction, Growth and Age of Southern Fin Whales. *Discovery Report*. 31:327-486.

Li, C., Coolen, J.W.P., Scherer, L., Mogollon, J.M., Braeckman, U., Vanaverbeke, J., Tukker, A. and Steubing, B., 2023. Offshore Wind Energy and Marine Biodiversity in the North Sea: Life Cycle Impact Assessment for Benthic Communities, *Environmental Science and Technology.* 57(16);6455-6464.

Lucieer V, Walsh P, Monk J, Flukes E. 2025. Seamap Australia National Benthic Habitat Layer (NBHL) 2025. Institute for Marine and Antarctic Studies (IMAS), University of Tasmania (UTAS)

Mackintosh, N.A. 1965. *The stocks of whales*. London: Fishing News (Books) Ltd.

Madsen, P.T., Wahlberg, M., Tougaard, J., Lucke, K. and Tyack, P., 2006. Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs. *Marine Ecology Progress Series*. 309, 279-295.

Malcolm, H., B.D. Bruce & J. Stevens. 2001. A Review of the Biology and Status of White Sharks in Australian Waters. Environment Australia, Canberra.

Mansergh, I.E and Norris, R.C. (1982). Sites of Zoological Significance in Central Gippsland. E.S.P. No.359. Ministry for Conservation Victoria.

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.

Miller, B.S., N. Kelly, M.C. Double, S.J. Childerhouse, S. Laverick & N. Gales. 2012. *Cruise report on SORP 2012 blue whale voyages: development of acoustic methods*. Paper SC/64/SH11 presented to the IWC Scientific Committee.

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., Langlois, T., Spencer, C., Woolley, S., Flukes, E., Gibbons, B., Bastiaansen, A., Hulls, J., Lucieer, V., Grammer, G., Hayes, K., Dunstan, P., & Barrett, N. 2024. Habitat modelling of 'functional reef' and broad-scale ecosystem components for temperate Australian waters [Data set]. Institute for Marine and Antarctic Studies & NESP Marine and Coastal Hub. https://doi.org/10.25959/BVJ7-D984

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.

Müller, A., Juretzek C. & Boethling M., 2019: Monitoring and assessment of the effectiveness of noise mitigation measures to reduce impact by percussive pile driving in German waters. Part one: Noise abatement strategy, thresholds, standards, legislative and administrative actions. In: Technical Report, R&D „Assessment approaches for underwater sound monitoring associated with offshore approval procedures, maritime spatial planning and the marine strategy framework directive – BeMo", Order Nr. 10036955, Bundesamt für Seeschiffahrt und Hydrographie (BSH).

Navy, 2022. *Bases and Establishments*. Available at: https://www.navy.gov.au/establishments

National Offshore Petroleum Titles Administrator [NOPTA], 2025. Guideline: Offshore Greenhouse Gas Assessment Permits – Work-bid. Australian Government. Department of Industry, Science and Resources. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.nopta.gov.au%2F_documents%2Fguidelines%2FGHG-Guideline-Offshore-GHG-Assessment-Permit.docx&wdOrigin=BROWSELINK

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.

O'Hara, T.D., Norman, M.D. and Staples D.A. (2002) Baseline monitoring of Posidonia seagrass beds in Corner Inlet, Victoria. Museum Victoria Science Reports 1: 1-44

Offshore Wind Facts. 2025. Deeper Dive: Electromagnetic Fields (EMFs) and Offshore Wind. Accessed 25/02/25: Deeper-Dive_-EMFs_FINAL-1.pdf

Ohman, M.C., Sigray, P. & Westerberg, H. 2007. Offshore windmills and the effects of electromagnetic fields on fish. AMBIO: A journal of the Human Environment, 36(8), pp.630-633.

Parker, D.A.A. 1978. Observations of Whales on Australian National Antarctic Research Expeditions (ANARE) Voyages between Australia and Antarctica. *Australian Wildlife Research*. 5:25-36.

Parks Victoria. n.d. Gippsland Lakes Coastal Park. Parks Victoria, Victoria State Government. Available from: https://www.parks.vic.gov.au/places-to-see/parks/gippsland-lakes-coastal-park, accessed 01 February 2025.

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, 2012. Corner Inlet and Nooramunga Marine and Coastal Parks Visitor Guide. Available at: b90dc671ab50e712165e8e9092bb9bc420d2d49d470a75d5952f7b9418571c62.pdf

Parks Victoria. 2006a. Ninety Mile Beach Marine National Park Management Plan, Parks Victoria, Melbourne.

Parr. W., Mainstone, C.P. and Morgan, N., 1998. Nutrient budgets for the upper reaches of the Hampshire Avon. CO 4426/3. Medmenham, WRc. Pp. 58.

Pendoley, K. L., 2005. Sea turtles and the environmental management of industrial activities in north west Western Australia. Ph.D. Thesis, Murdoch University, Perth

Pimental, D., Lach, L., Zuniga, R. and Morrison, D., 2000. Environmental and Economic Costs of Nonindigenous Species in the United States. *BioScience.*50,1. 53-65.

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 Tavolga, 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.

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.

Rivier, A., Bennis, AC., Pinon, G. *et al.* 2016. Parameterization of wind turbine impacts on hydrodynamics and sediment transport. *Ocean Dynamics* **66**, 1285–1299 (2016). https://doi.org/10.1007/s10236-016-0983-6

South Australia Department of Planning, Transport and Infrastructure [SA DPTI], 2012. Underwater Piling Noise Guidelines. Government of South Australia. Available at: https://www.dit.sa.gov.au/__data/assets/pdf_file/0004/88591/DOCS_AND_FILES-7139711-v2-DIT_2012_Underwater_Piling_Noise_Guidelines.pdf

Sammut J, White I Melville MD. 1996. Acidification of an estuarine tributary in eastern Australia due to drainage of acid sulfate soils . *Marine and Freshwater Research* **47**, 669-684.

Seamap Australia – National Marine Benthic Habitat Map. 2023, Seamap Australia - National Marine Benthic Habitat Map, viewed 22 January 2025, <https://seamapaustralia.org/>.

[SEER] Synthesis of Environmental Effects Research, 2022. Benthic disturbance from offshore wind foundations anchors, and cables. U.S. Offshore Wind. Available at: SEER Educational Research Brief: Benthic Disturbance from Offshore Wind Foundations, Anchors, and Cables.

Simpson, S.L., Mosley, L., Batley, G.E. and Shand, P., 2018, National Acid sulfate soils guidance: Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management, Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.

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).

Sørensen, K., Neumann, C., Dähne, M., Hansen, K.A and Wahlberg, M. 2020, Gentoo penguins (*Pygoscelis papua*) react to underwater sounds. *R. Soc. Open Sci*. 7, 191988. (doi:10.1098/rsos.191988)

Stamation 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.

Taylor, B.L., S.J. Chivers, J. Larese & W.F. Perrin. 2007. *Generation length and percent mature estimates for IUCN assessments of cetaceans*. Southwest Fisheries Science Center.

TeleGeography, 2024. Submarine Cable Map 2024. Available at: https://submarine-cable-map-2024.telegeography.com/

Terschek, A., Tremblay, N., Wang, S.V. & Beermann, J. 2025. Anthropogenic low-frequency sound effects on resting metabolism and energy pathways in two marine benthic crustaceans. Mar Biol 172: 67.

The State of Victoria Department of Environment, Land, Water and Planning. 2017. Our Wildlife Fact Sheet: Southern Right Whale. Access: https://www.wildlife.vic.gov.au/__data/assets/pdf_file/0021/90750/Southern-Right-Whale.pdf.

Threatened Species Section. 2025. Southern Right Whale *(Eubalaena australis): Species Management Profile for Tasmania's Threatened Species Link*. https://www.threatenedspecieslink.tas.gov.au/Pages/Southern-Right-Whale.aspx Department of Natural Resources and Environment Tasmania. Accessed on 5/3/2025.

Tidau, S., Briffa, M., 2016. Review on behavioral impacts of aquatic noise on crustaceans. In: Proceedings of Meetings on Acoustics, 27. https://doi.org/10.1121/2.0000302

TSSC (Threatened Species Scientific Committee), 2015. Conservation Advice. *Rhincodon typus* whale shark. Available at: https://www.environment.gov.au/biodiversity/threatened/species/pubs/66680-conservation-advice-01102015.pdf

U.S. Offshore Wind Synthesis of Environmental Effects Research [SEER], 2022b. Electromagnetic field effects on marine life. Report by National Renewable Energy Laboratory and Pacific Northwest National Laboratory for the U.S. Department of Energy, Wind Energy Technologies Office.

van Berkel, J., H. Burchard, A. Christensen, L.O. Mortensen, O. Svenstrup Petersen, and F. Thomsen. 2020. The effects of offshore wind farms on hydrodynamics and implications for fishes. *Oceanography* 33(4):108–117, https://doi.org/10.5670/oceanog.2020.410.

Vanderlaan, A.S.M., Taggart, C.T., 2007. Vessel collisions with whales: the probability of lethal injury based on vessel speed. Marine Mammal Science 23, 144–156. https://doi.org/10.1111/j.1748-7692.2006.00098.x.

Vella, G., Rushforth, I., Mason, E., Hough, A., England, R., Styles, P. Holt, T. and Thorne, P., 2001. Assessment of noise and vibrations of offshore windfarms on marine wildlife. ETSU W/13/00566/00/REP.

VFA, 2025. Commercial Fisheries. Victorian Fisheries Authority. Available at: https://vfa.vic.gov.au/commercial-fishing/commercial-fisheries

VisitVictoria, 2023. Beaches and Coastlines: Ninety Mile Beach. Available at https://www.visitmelbourne.com/regions/gippsland/see-and-do/nature-and-wildlife/beaches-and-coastlines/ninety-mile-beach

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, 6

Watkins W.A., P. Tyack, K.E. Moore & J.E. Bird. 1987. The 20-Hz signals of finback whales *(Balaenoptera physalus)*. *Journal of Acoustical Society of America*. 82:1901-1912.

Watson, M., Stamation, K., Charlton, C., & Bannister, J. L. (2021). Calving rates, long-range movements and site fidelity of southern right whales (Eubalaena australis) in south-eastern Australia. Journal of Cetacean Research and Management, 22: 17–27.

Wei, C. and Erbe, C. 2024. Sound reception and hearing capabilities in the Little Penguin (*Eudyptula minor*): first predicted in-air and underwater audiograms. *R. Soc. Open Sci.* 11:240593.

Weimerskirch H, Guionnet T, Martin J, Shaffer SA, Costa DP. Fast and fuel efficient? Optimal use of wind by flying albatrosses. Proc R Soc B Biol Sci. 2000;267:1869–74. doi: 10.1098/rspb.2000.1223

Wiese, F.k., Montevecchi, W.A., Davoren, G.K., Huettmann, F., Diamond, A.W. and Linke, J. 2001. Seabirds at Risk around Offshore Oil Platforms in the North-west Atlantic. *Marine Pollution Bulletin.* 42,12. 1285-1290.

Witherington, B.E. and Martin, E. 2003. Understanding, Assessing and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches. Florida Fish and Wildlife Conservation Commission Technical Report Tr-2, Third Edition.

WSP, 2023a. Aurora Green OWF – Preliminary Marine Ecology Assessment.

WSP, 2023b. Aurora Green OWF – Geological and Geotechnical Desktop Study.

APPENDIX A EPBC ACT PROTECTED MATTERS SEARCH TOOL

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: 31-Jul-2025

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:	92
Listed Migratory Species:	67

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:	102
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:	8
Regional Forest Agreements:	1
Nationally Important Wetlands:	2
EPBC Act Referrals:	32
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	Buffer Status
Corner inlet	Within Ramsar site	In feature area
Gippsland lakes	Within Ramsar site	In feature area

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 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	Buffer Status
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	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			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	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

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
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat 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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	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
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known 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
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known 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
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In feature area
FISH			
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat may occur within area	In feature area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Seriolella brama](#)			
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
FROG			
[Litoria aurea](#)			
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature 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	In feature area
[Uperoleia martini](#)			
Martin's Toadlet [1873]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
[Antechinus minimus maritimus](#)			
Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to 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
[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	In feature area
[Eubalaena australis](#)			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Isoodon obesulus obesulus](#)			
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Potorous tridactylus trisulcatus](#)			
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Pseudomys novaehollandiae](#)			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
[Amphibromus fluitans](#)			
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Caladenia tessellata](#)			
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Commersonia prostrata](#)			
Dwarf Kerrawang [87152]	Endangered	Species or species habitat likely to occur within area	In feature area
[Dianella amoena](#)			
Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area	In feature area
[Dodonaea procumbens](#)			
Trailing Hop-bush [12149]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Glycine latrobeana](#)			
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Lepidium hyssopifolium](#) Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In feature area
[Prasophyllum spicatum](#) Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Pterostylis chlorogramma](#) Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Senecio psilocarpus](#) Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Thelymitra epipactoides](#) Metallic Sun-orchid [11896]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Thelymitra matthewsii](#) Spiral Sun-orchid [4168]	Endangered	Species or species habitat may occur within area	In buffer area only
[Thesium australe](#) Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
[Xerochrysum palustre](#) Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	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	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lissolepis coventryi			
Swamp Skink, Eastern Mourning Skink [84053]	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 feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna 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 may occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Species or species habitat may 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

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
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
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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	Foraging, feeding or related behaviour known to occur within area	In feature area
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 Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to 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 known to 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 feature area
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
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat known to occur within area overfly marine area	In buffer area only
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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine 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
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature 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	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
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Species or species habitat may 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature 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	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In feature area
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine 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
[Kaupus costatus](#) Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 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
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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
Mammal			
[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 may 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	Foraging, feeding or related behaviour 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
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may 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
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

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

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Darriman H29 B.R	Natural Features Reserve	VIC	In buffer area only
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC	In buffer area only
Gippsland Lakes Coastal Park	Conservation Park	VIC	In buffer area only
Jack Smith Lake W.R	Natural Features Reserve	VIC	In buffer area only
Lake Denison W.R	Natural Features Reserve	VIC	In buffer area only
Ninety Mile Beach	Marine National Park	VIC	In feature area
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC	In feature area
NOORAMUNGA STATE FAUNAL RESERVE	Nature Conservation Reserve	VIC	In buffer area only

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	Buffer Status
Gippsland RFA	Victoria	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Corner Inlet	VIC	In feature area
Jack Smith Lake State Game Reserve	VIC	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Aurora Green Offshore Wind Farm Preliminary Surveys	2024/09968		Completed	In feature area
Blue Mackerel North Offshore Wind Farm Marine Surveys	2024/09934		Completed	In feature area
Blue Marlin Offshore Wind Energy Project	2023/09532		Completed	In feature area
Gippsland Dawn Offshore Wind Project Geophysical and Geotechnical Investigations	2024/10030		Referral Decision	In feature area
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed	In feature area
Gippsland Offshore Wind Transmission 2GW Project	2024/09980		Assessment	In buffer area only
Gippsland Renewable Energy Zone Project	2022/09346		Assessment	In buffer area only
Gippsland Skies Offshore Wind Project marine surveys (investigations)	2024/09991		Referral Decision	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
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision	In feature area
Preliminary Site Investigations for Great Eastern Offshore Wind	2024/09890		Referral Decision	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Project				
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed	In feature area
Seadragon Offshore Wind Farm	2022/9163		Completed	In feature area
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Completed	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				
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed	In feature area
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed	In feature area
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Gas Pipeline	2000/20	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

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
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

Scientific Name	Behaviour	Presence	Buffer Status
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
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present	In feature area

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	Buffer Status
Gippsland	Gippsland Basin	BA website	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 is 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 on the contents of this report.

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 point locations and environmental data layers.

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 when time permits.

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 breeding sites; and
- 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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

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: 31-Jul-2025

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:	40

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	61
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	24
Key Ecological Features (Marine):	None
Biologically Important Areas:	11
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 may 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 likely 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			
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna 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 may 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
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat 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 likely 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
[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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
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
Pandion haliaetus			
Osprey [952]		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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area	In feature area
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 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
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
Mammal			
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 may occur within area	In feature area
Reptile			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely 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
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may 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

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

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Aurora Green Offshore Wind Farm Preliminary Surveys	2024/09968		Completed	In feature area
Blue Mackerel North Offshore Wind Farm Marine Surveys	2024/09934		Completed	In feature area
Blue Marlin Offshore Wind Energy Project	2023/09532		Completed	In feature area
Gippsland Dawn Offshore Wind Project Geophysical and Geotechnical Investigations	2024/10030		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

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed	In feature area
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision	In feature area
Preliminary Site Investigations for Great Eastern Offshore Wind Project	2024/09890		Referral Decision	In feature area
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed	In feature area
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Completed	In feature area
Controlled action				
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued	In buffer area only
Not controlled action				
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed	In feature area
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Gas Pipeline	2000/20	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

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
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

Scientific Name	Behaviour	Presence	Buffer Status
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
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 is 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 on the contents of this report.

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 point locations and environmental data layers.

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 when time permits.

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 breeding sites; and
- 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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

APPENDIX B FEAST ASSESSMENT

FeAST Assessment
wind farm

The Feature Activity Sensitivity Tool (FeAST) provides a rapid first-pass environmental risk assessment for proposed activities (development, use or works) in Victorian marine and coastal environments. FeAST assists with the preliminary screening of risk and does not replace the need for more detailed environmental or ecological assessments.

FeAST uses the best-available information from CoastKit to perform a desktop-based assessment. The tool evaluates the proposal's potential environmental impacts on marine and coastal habitats and provides tabled lists of nearby features for further investigation. The report has four sections:

1. **Pressure score:** This first step identifies all the pressures likely to arise from the selected activities and evaluates the intensity. The Pressure score indicates the potential effect that each activity may have on the ecosystem under normal conditions.
2. **Habitat score:** This is the second step in calculating the overall FeAST score. This score provides a total sensitivity value for each habitat type within the defined project area for pressures with a medium or high Pressure score. The sensitivity is a measure of the habitat's response to the activities in terms of its ability to resist or recover from impact.
3. **FeAST score:** This final score provides overall risk levels for the proposal, evaluating the Habitat scores and Pressure scores against the estimated exposure level. The exposure level is determined by calculating the spatial overlap of the defined project area with the habitat's known distribution.
4. **Proximity analysis:** This provides tables of the key marine and coastal features located directly within the defined project area or within a 2km buffer from the project boundary.

The FeAST report outputs should be considered in the context of the limitations of the tool and all relevant legislation, policy, and advice. Please refer to the FeAST Guidelines for more information.

Proposal activities

Offshore wind - Construction	Offshore wind - Operation and maintenance	Offshore wind - Decommissioning

Location of proposal

Defined project area	675.570 km^2
Biounits	Wilsons Prom East, Ninety Mile Beach and Gippland Lakes
Nearest LGA	Wellington Shire
Nearest Locality	Mcloughlins Beach, Giffard West, Darriman, Woodside Beach, Giffard, Woodside
Registered Aboriginal Party	Gunaikurnai Land And Waters Aboriginal Corporation

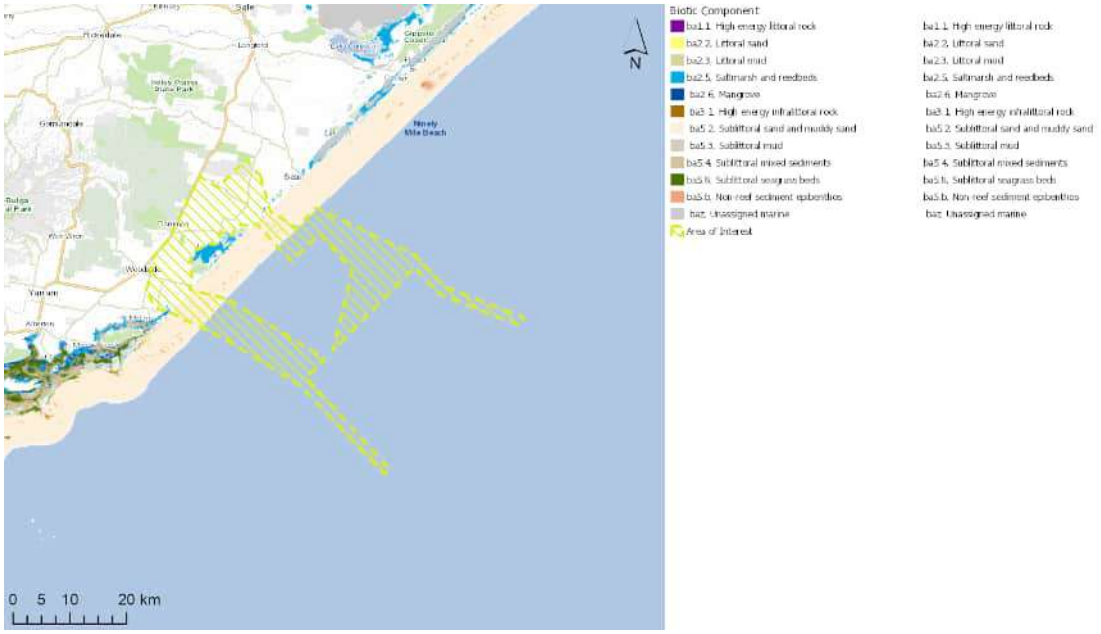
FeAST results summary

Number of high and medium pressures across all proposal activities	20

Pressure score	High		Medium	

Above water noise	Abrasion to seabed	Barrier to species movement	Change of seabed type	Change of sediment type
Collision above water	Collision below water	Electromagnetic changes	Light siltation or smothering	Penetration to seabed substrates
Underwater noise	Visual disturbance	Water clarity changes	Water flow changes	Wave energy changes
Hydrocarbon contamination	Introduction of light	Invasive species	Litter	Vibration

Number of unique habitat types in the defined project area	6



Legend						
Habitat type	Saltmarsh and reedbeds	Littoral sand	High energy littoral rock	High energy infralittoral rock	Sublittoral sand and muddy sand	Non-reef sediment epibenthos
FeAST Score	Medium risk	Low risk	Low risk	Low risk	Low risk	Medium risk

1. Pressure score

Activities can exert multiple impacts, hazards or threats on the environment resulting in physical, biological or chemical changes, these are referred to as pressures in FeAST. In this step, each pressure is profiled for intensity, which is based on the potential ecological effect and then scored from low to high, where applicable. The Pressure score acts as a screening process to remove pressures of least concern from the FeAST assessment (see table).

When multiple activities have been selected, the Pressure score analysis adopts a precautionary approach and takes the worst or highest intensity score across the activities as the Pressure score. The spatial location and area of the proposal is not factored into the analysis in this step.

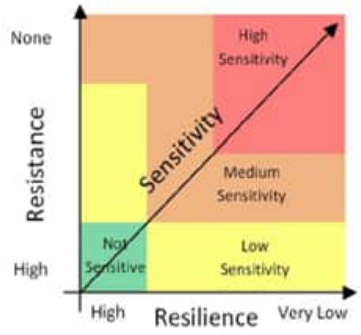
Intensity	Potential ecological effect	Assessment in FeAST
High	Ecosystem functional change	Included in the FeAST assessment, with the highest score across all activities used as the Pressure score
Medium	Populations and communities will shift a distinct level	
Low	Some noticeable change	Excluded from the FeAST assessment
NA	Not applicable	

	Activity			
Pressures	**Offshore wind - Construction**	**Offshore wind - Operation and maintenance**	**Offshore wind - Decommissioning**	**Pressure score**
Above water noise	Medium	High	Medium	High
Abrasion to seabed	High	Medium	High	High
Barrier to species movement	Medium	High	Medium	High
Change of seabed type	High	Low or NA	High	High
Change of sediment type	High	Low or NA	High	High
Collision above water	Medium	High	Medium	High
Collision below water	Medium	High	Medium	High
Electromagnetic changes	Low or NA	High	Low or NA	High
Light siltation or smothering	High	Low or NA	High	High
Penetration to seabed substrates	High	High	High	High
Underwater noise	High	Medium	High	High
Visual disturbance	High	High	High	High
Water clarity changes	High	High	High	High
Water flow changes	Medium	High	Medium	High
Wave energy changes	Low or NA	High	Low or NA	High
Hydrocarbon contamination	Medium	Medium	Medium	Medium
Introduction of light	Medium	Low or NA	Medium	Medium
Invasive species	Medium	Medium	Medium	Medium
Litter	Medium	Low or NA	Medium	Medium
Vibration	Medium	Medium	Medium	Medium

2. Habitat score

This step evaluates the sensitivity of specific habitats, which occur within the defined project area, to each of the relevant and screened activity-induced pressures. Sensitivity is calculated by determining the resistance, which measures the likelihood of the habitat to tolerate change, versus the resilience of the habitat to adapt and recover once the pressure has ceased (see diagram).

The Habitat score provides an indication of the overall sensitivity of each habitat type to the proposal, this incorporates the combined effect of the screened pressures across all selected activities. Each habitat is assigned a value from low to high, and none when a pressure poses no threat. The Habitat scores are calculated as a percentage, where a 100% score would indicate that a habitat type has a high sensitivity to the proposal (see table).



Habitat Score	Very Low	Low	Medium	High
Percentage	<55%	55- 70%	70- 85%	85-100%

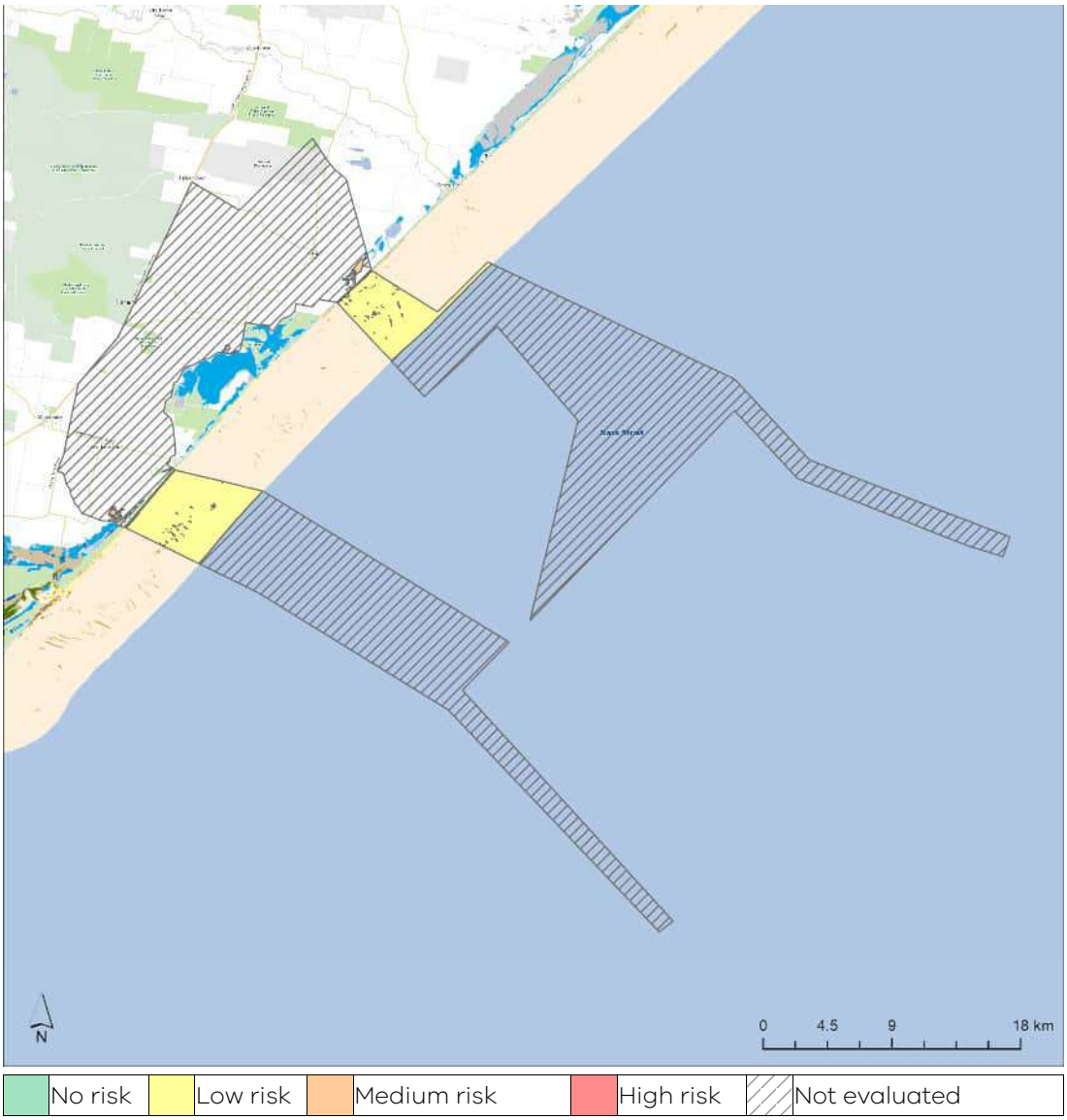
Legend						
Pressure	**High Energy Littoral Rock**	**Littoral Sand**	**Saltmarsh And Reedbeds**	**High Energy Infralittoral Rock**	**Sublittoral Sand And Muddy Sand**	**Non-Reef Sediment Epibenthos**
Wave energy changes	High	Medium	High	Medium	Medium	High
Abrasion to seabed	High	Low	High	Medium	Low	Medium
Change of seabed type	High	Medium	High	Medium	Medium	High
Penetration to seabed substrates	High	Low	High	Medium	Low	High
Visual disturbance	Medium	None	Medium	None	None	None
Water clarity changes	Medium	Low	None	Medium	Low	Medium
Above water noise	Low	None	Low	None	None	None
Change of sediment type	None	Medium	High	None	Medium	High
Water flow changes	None	Medium	High	Medium	Medium	High
Barrier to species movement	None	None	High	None	None	None
Light siltation or smothering	Low	None	None	None	None	None
Invasive species	High	High	High	High	High	High
Hydrocarbon contamination	High	None	None	Medium	None	None
Introduction of light	None	None	Medium	None	None	None
Litter	High	None	None	None	None	None
Vibration	None	None	Medium	None	None	None
Habitat score	Medium (83%)	Medium (75%)	High (92%)	Medium (82%)	Medium (75%)	High (95%)

3. FeAST score

The FeAST score is the final step in the FeAST assessment and provides an indication of the overall risk posed by the proposal to the habitats within the defined project area. The FeAST score evaluates the level of exposure against the Habitat score.

The exposure level estimates the distribution and distinctiveness of each habitat to determine the proportional impact of the proposal, which is considered in the context of the 26 Victorian biounits. This is determined by calculating the habitat area impacted by the defined project area against the total habitat area across the relevant biounit to produce a percentage. In cases where the defined project area may cross two biounit boundaries, a precautionary approach is taken, and the highest FeAST score is used.

The map below displays the FeAST score for each habitat in the defined project area



FeAST Assessment	High energy littoral rock	Littoral sand	Saltmarsh and reedbeds	High energy infralittoral rock	Sublittoral sand and muddy sand	Non-reef sediment epibenthos
Habitat Score	Medium	Medium	High	Medium	Medium	High
Exposure Level for biounit: Wilsons Prom East		Low				
Exposure Level for biounit: Ninety Mile Beach	Low	Low	Low	Low	Low	Low
Exposure Level for biounit: Gippland Lakes			Low			
Feast score for biounit: Wilsons Prom East		Low risk				
Feast score for biounit: Ninety Mile Beach	Low risk	Low risk	Medium risk	Low risk	Low risk	Medium risk
Feast score for biounit: Gippland Lakes			Medium risk			
FeAST score	Low risk	Low risk	Medium risk	Low risk	Low risk	Medium risk

4. Proximity analysis

The Proximity analysis acts as a search tool to provide an indication of the key marine and coastal features that may occur or can sometimes occur within or nearby (up to 2km) the defined project area.

In addition to the FeAST score, it is critical for proposals to consider any impacts or negative interactions to existing marine and coastal activities, the natural environment and biodiversity, as well as designated conservation management and protection areas.

The tool generates a series of summarised tables from the Feature Atlas on CoastKit. Tables are organised into eight themes; Conservation and protected areas, Natural environment and biodiversity, Defence and national security, Energy generation and resource extraction, Fishing and aquaculture, Marine transport, Recreation, tourism and leisure, and Scientific and heritage areas.

Each table provides the feature category, feature name, description, and proximity. Feature records are ordered from largest overlap to furthest distance away. The proximity value is displayed as either:

- percentage overlap i.e., how much of the total defined project area is covered by the feature, or
- distance in metres i.e., how far the feature is from the boundary of the defined project area to a maximum buffer of 2km.

The number of tables displayed in the report will vary. If no features from a theme have been identified within 2km of the defined project area boundary, the corresponding table will not be displayed in the report. Some key spatial datasets have not been included in the proximity analysis, please refer to the guidelines for recommended advice on using other tools in conjunction with FeAST to deliver supplementary information to decision-makers.

Conservation and protected areas

This table lists protected and management areas that must be considered in compliance with relevant acts and regulations. Please note that marine asset areas do not have specific legislative requirements but are of high conservation value.

Feature name	Category	Description	Proximity
McGauran Beach offshore sediment	Marine asset areas	McGaurans Beach sublittoral offshore sediment communities	1 %
Ninety Mile Beach Marine National Park	Marine National Park	National Parks Act Schedule 4 park or reserve	1 %
Ninety Mile Beach patch reefs	Marine asset areas	Low profile patch reefs offshore from Ninety Mile Beach, between McLoughlins Beach and Lakes Entrance. Significant and unique sessile invertrate and filter feeding assemblages. Reefs are stepping-stone habitats for snapper, white shark and possible grey nurse sharks.	1 %

Woodside Beach offshore sediments	Marine asset areas	Woodside Beach sublittoral offshore sediment communities	1 %
Nooramunga Marine and Coastal Park	Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	0 m
Ramsar - Corner Inlet	UNESCO Ramsar site	Ramsar wetland bird habitat in Victoria. 25k resolution.	0 m

Natural environment and biodiversity

This table lists geological sites and areas of high biodiversity including significant habitats, FFG act listed marine communities and some important species sightings, and distributions (limited data available). It is recommended that the Protected Matters Search Tool and NatureKit should be used to extract the lists for threatened species observations, EPBC act protected values and migratory species.

Feature name	Category	Description	Proximity
AFD 248 - Significant ascidian site	Invertebrate records and areas	Species: Aplidium distaplium Kott, 1992, Status: Type locality - ascidian	1 %
AFD 249 - Significant ascidian site	Invertebrate records and areas	Species: Polyclinum orbitum Kott, 1992, Status: Type locality - ascidian	1 %
AFD 250 - Significant ascidian site	Invertebrate records and areas	Species: Synoicum obscurum Kott, 1992, Status: Type locality - ascidian	1 %
Bird area - breeding roosting 2009	Important bird areas	intertidal area that offers potential for feeding shorebirds	1 %
Estuary - Bruthen Creek	Estuary and inlet areas	Estuary classification (coast, mouth, head):B P E	1 %
Estuary - Jack Smith Lake	Estuary and inlet areas	Estuary classification (coast, mouth, head):E I E	1 %
Geoform - McGaurans Beach - Lagoon Sediments	Geological sites	Lagoon sediments indicating barrier formation and retreat.	1 %
McGauran Beach offshore sediment	Significant soft sediment habitat	McGaurans Beach sublittoral offshore sediment communities	1 %
Ninety Mile Beach patch reefs	Significant reef habitat	Low profile patch reefs offshore from Ninety Mile Beach, between McLoughlins Beach and Lakes Entrance. Significant and unique sessile invertrate and filter feeding assemblages. Reefs are stepping-stone habitats for snapper, white shark and possible grey nurse sharks.	1 %
Rare species - Halicarcinus sp MoV 746	Invertebrate records and areas	Halicarcinus sp MoV 746 - Crab - Rare and restricted in distribution - Museum record	1 %
Woodside Beach offshore sediments	Significant soft sediment habitat	Woodside Beach sublittoral offshore sediment communities	1 %
Hooded plover - Mcloughlins Beach - Seaspray Coastal Reserve	Important bird areas	Hooded Plover Thinornis rubricollis (endangered). Observed Sighting (Nesting?). This point derived from Michael Weston's report: Managing the Hooded Plover in Victoria: a Review of Existing Information.	289 m
Bird roost - McLoughlins Beach	Important bird areas	Major Roost. Medium numbers of waders, always in use.	1665 m
Bird area - breeding roosting 2009	Important bird areas	mostly saltmarsh.	1833 m
AFD 246 - Significant ascidian site	Invertebrate records and areas	Species: Distaplia retinaculata Kott, 1990, Status: Type locality endemic - ascidian	1872 m

Energy generation and resource extraction

The table lists existing areas for oil and gas infrastructure, saltworks and any sand extraction sites. Potential cumulative effects or interactions should be considered.

Feature name	Category	Description	Proximity
Facility - 35	Oil and gas platforms and facilities	Oil and gas platforms and facilities - from OSRA	1 %
Pipeline -	Oil and gas pipelines	Oil and gas pipelines for Victoria - from OSRA	1 %
Pipeline - PL30V	Oil and gas pipelines	Oil and gas pipelines for Victoria - from OSRA	1844 m

Scientific and heritage areas

This table lists important areas for research and monitoring purposes, as well as recorded non-Aboriginal historic sites in Port Phillip Bay and shipwreck sites across Victoria. Aboriginal cultural values have not been included, please refer to the Aboriginal Heritage Act 2006 and consult with the nearest Registered Aboriginal Party to meet your obligations.

Feature name	Category	Description	Proximity
Wreck - MAGNOLIA	Shipwreck sites	MAGNOLIA. Schooner. Built in in 1877. Wrecked in Disappeared between Refuge Cove and Lakes Entrance. in 1887.	1 %
Wreck - SARAH	Shipwreck sites	SARAH. Sailing schooner. Built in Australia in 1837. Wrecked in Woodside, Ninety Mile Beach in 1838.	1 %
Wreck - UNKNOWN BURIED WRECK MCLOUGHLINS BEACH	Shipwreck sites	UNKNOWN BURIED WRECK MCLOUGHLINS BEACH. Sailing vessel. Wrecked in sand dunes in the vicinity of McLoughlins Beach/ Reeves Beach, Ninety Mile Beach in 1830.	1 %

ERM HAS OVER 140 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

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

ERM's Melbourne Office

Level 8
501 Swanston Street
Melbourne VIC 3000

www.erm.com